Supply Chain Collaboration to Reduce Food Loss and Waste

A Multi-Case Study of Swedish Bread Suppliers and Retailers

Linn Bergman & Jessica Holmqvist

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Abstract

Food loss and waste is an urgent and important sustainability problem that needs to be addressed both globally and locally. This study focuses on understanding preconditions for supply chain collaboration to reduce food loss and waste in the suppliers-retailer interface. A multi-case study of Swedish bread suppliers and retailers was conducted by interviewing two Swedish bread suppliers and two Swedish bread retailers. The study identified preconditions for supply chain collaboration in terms of practices, motives and challenges. The study concluded that suppliers and retailers identify similar and different preconditions for supply chain collaboration to reduce food loss and waste. Foremost, information sharing, used to produce more accurate forecasts, is seen as a promising supply chain collaboration practice for both suppliers and retailers. Improving business performances, focusing on economic incentives, is an important supply chain collaboration motive. Lastly, supply chain collaboration challenges are mostly centered around power asymmetries between the suppliers and retailers. The study also indicated that supply chain collaboration is context dependent. Thus, creating different preconditions for supply chain collaboration for suppliers and retailers depending on the social context. Moreover, the identified supply chain collaboration practices, motives and challenges are all influenced and connected to one another. Hence, supply chain collaboration was found to be more complex in practice than as illustrated in previous research. For future studies, it would therefore be interesting to investigate supply chain collaboration between a plurality of actors and not only suppliers and retailers. More research is also needed in other food supply chains with particular focus on how such collaborations are functioning in practice. This would contribute to an increased academic and empirical understanding of supply chain collaboration to reduce food loss and waste in food supply chains, which remains a critical issue.

Keywords: supply chain collaboration, supply chain collaboration practices, supply chain collaboration motives, supply chain collaboration challenges, supply chain collaboration preconditions, Swedish bread supply chains, supplier-retailer interface, food loss and waste

Sammanfattning

Matsvinn och matavfall är ett kritiskt hållbarhetsproblem som behöver motverkas både på global och lokal nivå. Den här studien fokuserar på att skapa en bättre förståelse om förutsättningarna för leverantörssamarbete för att minska matsvinn och matavfall. Studien fokuserar specifikt på samarbete mellan leverantörer och återförsäljare. En flerfallsstudie av svenska bröd leverantörer och återförsäljare genomfördes genom att intervjua två svenska bröd leverantörer och två svenska brödåterförsäljare. Studien identifierade att samarbetsaktiviteter, motiv och utmaningar skapar förutsättningar för leverantörssamarbete. Studien identifierade även att leverantörer och återförsäljare förknippar liknande och olika typer av förutsättningar för leverantörssamarbete i syfte att minska matsvinn och matavfall. Framför allt visade sig delning av information utgöra en lovande samarbetsaktivitet för både leverantörer och återförsäljare, för att kunna ta fram mer exakta prognoser. Ett viktigt motiv för att samarbeta var möjligheten till att kunna förbättra resultaten inom aktörernas verksamhet. Slutligen var utmaningarna med samarbete mestadels centrerade kring maktobalanser mellan leverantörer och återförsäljare. Studien visade även att leverantörssamarbete är kontextberoende. Det innebär att förutsättningar för leverantörssamarbete är beroende av det sociala sammanhanget som leverantörer och återförsäljare befinner sig i. Dessutom är de identifierade samarbetsaktiviteterna, motiven och utmaningarna sammanlänkande, och de påverkas även av varandra. Därför pekar studien på att leverantörssamarbete är mer komplext i praktiken än vad som illustreras i tidigare forskning. För framtida studier skulle det därför vara intressant att undersöka leverantörssamarbete mellan andra aktörer, och inte bara mellan leverantörer och återförsäljare. Det behövs också mer forskning som fokuserar på hur samarbete går till i praktiken. Sådana studier hade kunnat bidra till en ökad akademisk och empirisk förståelse om leverantörssamarbete för att minska matsvinn och matavfall, vilket fortsatt utgör ett kritiskt problem.

Sökord: leverantörssamarbete, samarbetsaktiviteter, samarbetsmotiv, samarbetsutmaningar, leverantörssamarbete förutsättningar, svenska brödleverantörskedjor, matsvinn och matavfal

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Abbreviations

FAO	Food and Agriculture Organization of the United Nations
FLW	Food Loss and Waste
FSC	Food Supply Chain
SCC	Supply Chain Collaboration
SDG	Sustainable Development Goals
UN	United Nations
UTP	Unfair Trading Practices

1. Introduction

In this first chapter, the topic area of this study is problematized and the study focus is narrowed down to a specific context; how food loss and waste (FLW) can be reduced in Swedish bread supply chains through the use of supply chain collaboration (SCC). Thereafter, the research gap is elaborated on, the aim and research questions are stated, and the delimitations of the study are addressed. Lastly, the outline of the study´s structure is described.

1.1 Problem Background

The United Nations (UN) has estimated that 31 % of all food is lost or wasted throughout food supply chains (FSCs) globally. This number is very disturbing considering that there are around 800 million people in the world in hunger (UN n.d.a). Additionally, food being lost or wasted means that the resources used to produce the food are wasted too, for example, land, water and capital (UN n.d.b). Therefore, this is an urgent and important problem that needs to be addressed.

According to the Food and Agriculture Organization of the United Nations (FAO), food loss is defined as "the decrease in the quantity or quality of food resulting from decisions and actions by food suppliers in the chain, excluding retailers, food service providers and consumers" (FAO n.d.a). Food waste is defined as "the decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers" (ibid.). Briefly, both concepts refer to food products that are discarded, destroyed or disposed of from a FSC without re-entering it or another supply chain for utilization. For example, it could be because of sorting mechanisms and high quality standards, best-before dates or food surplus (ibid.). FLW includes both definitions, hence, referring to both food loss and food waste. Reduced FLW would improve efficiency in land use and water resource management, and have a positive effect on climate change and livelihoods (ibid.). Hence, FLW can also be identified as a sustainability problem.

According to the UN (n.d.a), FLW is occurring both globally and locally, and it is problematic on all sustainable development dimensions: economically, environmentally and socially. For example, FLW impacts economic sustainability

in regard to optimization and profitability (De Steur et al. 2016; Eriksson et al. 2017; Devin & Richards 2018; Brancoli et al. 2019). Environmental sustainability is impacted in terms of waste and exploitation of resources (Eriksson et al. 2017; Devin & Richards 2018; Brancoli et al. 2019). Lastly, FLW impacts social sustainability in regard to food scarcity and allocation (De Steur et al. 2016; Eriksson et al. 2017; Devin & Richards 2018). Combating FLW is part of the UNs Sustainable Development Goals (SDGs), which all UN member states have committed to since 2015 (UN n.d.c). FLW directly and indirectly relates to many of the SDGs, but clearly affects both SDG 2; which is connected to food security, and SDG 12; which is connected to sustainable production and consumption. FLW is directly addressed in SDG 12.3, stating that the amount of FLW should be reduced by 50 % by 2030. This includes all stages of FSCs, from production to consumer (FAO n.d.b). As such, FLW urgently needs to be addressed globally, but also locally in countries, industries, and organizations.

Developing countries are struggling with FLW in all stages of FSCs (Göbel et al. 2015). However, it is mostly present towards the end of FSCs in developed countries (Muth et al. 2019). More specifically, most FLW occurs at the consumer stage, estimated to be about 46- 65 % of all FLW in FSCs (Annosi et al. 2021). However, the retailer stage is also a significant contributor to FLW in FSCs (Devin & Richards 2018). This is also the case for Sweden, which this study focuses on, where households generate the most avoidable FLW, followed by retailers (The Swedish Environmental Protection Agency 2018). In 2018, retailers disposed of around 100 000 tonnes in Sweden, an increase of 70 % compared to 2016 (ibid.). Additionally, about a fourth of Sweden's total climate impact is caused by food (Hallå konsument n.d.), making food production, consumption, loss and waste important to investigate.

The FAO has identified causes to FLW in developed countries to include supply exceeding demand, high quality standards, and that it is cheaper to dispose of unused food products than to use or find use or reuse alternatives (Devin & Richards 2018). Moreover, Eriksson et al. (2017) state that the issue of FLW is not the waste itself. FLW can in many ways be viewed as a resource, and many organizations and companies have entered the food industry market building their operations on that concept. Examples of such companies in Sweden include *Too Good To Go*, *Matsmart* and *Sopköket*, just to mention a few. However, as argued by Devin and Richards (2018), while food rescue organizations or circularity brokers are prolonging the food´s value chain, they do not affect the structural issues in FSCs that cause FLW. Similarly, Eriksson et al. (2017) highlight the overproduction of food, and the behaviors causing the overproduction, to be vital finding solutions to. Thus, in a developed country like Sweden, there is a need to prevent overproduction causing FLW to occur in the first place.

Similarly, previous research, for example Annosi et al. (2021), Brancoli et al. (2019) and Eriksson et al. (2017), identify prevention strategies to be the most important to address FLW. There are also official frameworks that rank waste management strategies, placing prevention strategies as the most preferable to be prioritized (Eriksson et al. 2017). The EU Waste Hierarchy and the US Food Recovery Hierarchy are examples of such frameworks. At the same time, prevention strategies in FSCs can be problematic because actors can only directly influence FLW in the supply chain stage in which they are operating. Further, implementing practices to reduce FLW is often costly and requires more labor for the actor. A supplier may actually benefit from oversupplying, which in turn promotes overproduction (ibid.). Hence, preventing overproduction of food in FSCs is not as straightforward as one might think, which will be elaborated on in the next section.

1.2 Problem Formulation

Swedish food retailers have high bargaining power because they are few and possess most of the market shares (Ghosh & Eriksson 2019). Compared to suppliers, retailers also have a direct connection to customers. This power asymmetry frees retailers to operate in ways that benefit them. For example, by setting high quality standards or over-ordering (ibid.). Canali et al. (2017) and Herzberg et al. (2022) highlight that this power imbalance inhibits reduction of FLW. Instead, it leads to increased costs and risks for the supplier; as the supplier in most cases has to deal with the food surplus (ibid.). Hence, FSC actors are affected by actions taken in other stages of the chain (Canali et al. 2017). This makes it difficult for actors to address FLW in FSCs (Eriksson et al. 2017). Moreover, sustainable development is often neglected prior to customer demands; concerning low prices, wide product-ranges and high-quality products, where retailers' over-ordering is defended by changing customer preferences (Ghosh & Eriksson 2019). Thereby, it is a balancing act in promoting sustainable actions and maintaining market position (Fernqvist & Göransson 2021). Hence, it seems like FLW in FSCs is highly problematic at the supplier-retailer interface.

Eriksson´s et al. (2017) study focuses on the supplier-retailer interface in Swedish FSCs. Their study found that bread supply chains had the most FLW, compared to dairy and fresh fruit and vegetables (ibid.). Many other studies support that FLW is problematic in Swedish bread supply chains, for example Ismatov (2015) and Iakovlieva (2021). These findings illustrate that FLW in the supplier-retailer interface in Swedish bread supply chains is especially problematic, making it an important area to investigate.

Previous research has suggested solutions to reduce FLW in FSCs, including: legislation using economics instruments (Devin & Richards 2018; Brancoli et al. 2019), collaboration between actors and higher quality data analysis (Kaipia et al. 2013; Annosi et al. 2021). The Swedish government promotes informative policy instruments to reduce FLW, as can be seen in the *More to do more* (Swedish Food Agency 2018) national action plan to reduce FLW. Hence, in the Swedish context, the problem and need for research lies in further investigation of collaboration as a solution to reduce FLW in bread supply chains. This study's definition of collaboration is elaborated on in section 1.5 and in chapter two. Next, the research gap will be addressed to further support the relevance of this study.

1.3 Research Gap

Collaboration between actors in FSCs has been identified as one solution to reduce FLW in previous research (Kaipia et al. 2013; Annosi et al. 2021). León-Bravo et al. (2018a), explain that since collaboration is a broad concept, there is a need to acquire a better understanding of collaboration in the context of supply chains. Most previous research on FLW in FSCs in developed countries has focused on identifying causes to FLW and quantified economic and environmental impacts of FLW (Mena et al. 2011; Eriksson & Spångberg 2017; Ghosh & Eriksson 2019; Chauhan et al. 2021). This is also the case for the studies limited to a Swedish scope, for example Brancoli et al. (2017) and Eriksson et al. (2012). Previous research on FLW in FSCs in developed countries has also focused on one FSC-stage, mainly the consumer level, or the entire supply chain (Herzberg et al. 2022). Cao and Zhang (2011) highlight that there is a lack of studies collecting data from more than one actor when studying collaboration in supply chains. There are also few in-depth studies on relationships in supply chains (Göbel et al. 2015). In Sweden particularly, there is a lack of studies focusing on the interlinkages between two different stages in a FSC (Tälle et al. 2019). Therefore, the researchers of this study have identified a research gap in understanding collaboration in FSCs to reduce FLW, focusing on a developed country; Sweden.

Aggarwal and Srivastava (2016) further explain the need for investigating collaboration aiming to reduce FLW, specifically focusing on suppliers and retailers. For example, how such collaborations impact supply chains upstream or downstream (ibid.). This supports the relevancy and need for this study; striving to better understand collaboration at the supplier-retailer interface to reduce FLW. There is also a need to better understand the drivers and challenges for collaboration and how collaborative relationships are developed in supply chains (Matopoulos et al. (2007). In Sweden, several studies have also identified the supplier-retailer

interface to be especially problematic in bread supply chains (Ismatov 2015; Eriksson et al 2017; Iakovlieva 2021), supporting the context of the study.

The aim and research questions of this study, stated in the next section, addresses the identified research gap. The study will therefore contribute to an increased knowledge of how collaboration can develop between suppliers and retailers to reduce FLW. This, by identifying how collaborations in practice are conducted and perceived by suppliers and retailers as separate units. Thus, the study also contributes to the business administration field by increasing the understanding of collaboration between organizations within supply chains.

1.4 Aim and Research Questions

The aim of the study is to increase the understanding of preconditions for SCC between suppliers and retailers to reduce FLW. A multi-case study of Swedish bread supply chains was conducted to address this research aim. The research questions for the study follows:

1. What types of collaboration practices do bread suppliers and retailers engage with to reduce food loss and waste?

2. What are the motives for bread suppliers and retailers to collaborate to reduce food loss and waste?

3. What challenges do bread suppliers and retailers associate with collaboration to reduce food loss and waste?

1.5 Delimitations

While FLW is a global problem, the researchers limited the study to FLW in developed countries, specifically Sweden. As such, in developed countries, FLW is most evident in the downstream stages of FSCs (Muth et al. 2019). Therefore, in accordance with the problem formulation and research gap, the study's scope is delimited to the supplier-retailer interface, where the focus is to investigate how SCC can be used to reduce FLW in FSCs. Further, the study limits the concept of collaboration to a market and business context, and refers to it as SCC. Based on previous SCC literature, this study defines SCC as a social process between at least two actors working together for a joint purpose. Moreover, the study identifies SCC practices, motives and challenges occurring between collaborative actors, together viewed as SCC preconditions. The concept of SCC is elaborated on in chapter two.

Empirically, this study is delimited to a multi-case study, investigating SCC at the supplier-retailer interface in Swedish bread supply chains. The multi-case study is based on a selection of suppliers and retailers as informants for data collection. This enables an analysis identifying similarities and differences on suppliers' and retailers' perceptions of SCC to reduce FLW. In the supplier stage, data is collected from Saltå Kvarn and Délifrance. In the retailer stage, data is collected from two Swedish grocery stores: ICA Maxi Stormarknad Lindhagen and ICA Maxi Stormarknad Värmdö. They will be referred to as ICA Lindhagen and ICA Värmdö respectively. Therefore, the supplier-retailer interface in Swedish bread supply chains specifically refers to larger sized companies. The suppliers are selling fresh or frozen bread to various retailers, such as grocery stores and restaurants. The retailers are delimited to grocery stores, which purchase bread, fresh or frozen, from various suppliers. These companies are further introduced in chapter four.

Lastly, the researchers would like to stress that the bread suppliers and retailers, which the empirical data is collected from, are not collaborating directly with each other. Instead, they have their own separate collaborations within their respective bread supply chains. Therefore, when analyzing SCC to reduce FLW in the supplier-retailer interface, collaboration will be viewed from the bread suppliers' perspective on one hand, and the retailers' perspective one the other hand. Thereafter, SCC preconditions can be identified.

1.6 Outline of the Study

The study is divided into seven chapters. In this first chapter, the study has been introduced and the topic has been problematized. Further, the chapter has presented the study's research gap, aim, research questions and delimitations. In the following chapter, a literature review and conceptual framework provides an understanding of the study's focus based on previous research. Departed from these findings, the chapter ends with presenting the developed conceptual framework of the study. The framework is used to approach and analyze the aim and research questions. Chapter three explains how, and on what grounds, the study is conducted. Thereafter, in chapter four, the empirical findings are presented and analyzed. These findings are then discussed in chapter five in relation to previous research as well as the aim and research questions. The study ends with a conclusion, contributions and suggestions for future research in chapter six, followed by the references used and appendixes. The outline of the study is illustrated in figure 1 below.

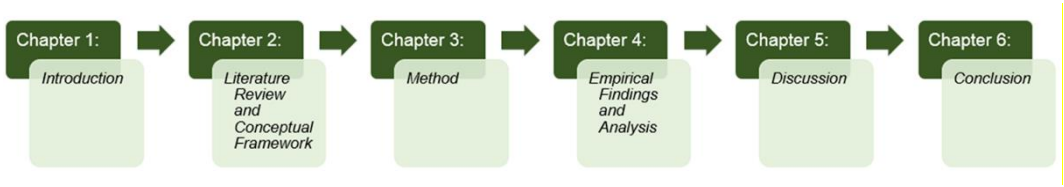

Figure 1. Outline of the Study. Own Illustration

2. Literature Review and Conceptual Framework

This chapter presents a literature review on food loss and waste and food supply chains. Further, the concept of supply chain collaboration is elaborated on, focusing on supply chain collaboration practices, motives and challenges. Lastly, the chapter illustrates the developed conceptual framework of the study; to be used as an analytical tool to fulfill the aim and answer the research questions.

2.1 Food Loss and Food Waste

The concept of FLW is important to define because there is a lack of consensus in how FLW is conceptualized in previous research as well as by organizations and governmental agencies in policy statements and legislation. Some definitions are illustrated in table 1 below.

Table 1. Different Definitions and Conceptualizations of Food Loss and Waste.

	Definitions/ Conceptualizations of Food Loss	**Definitions/ Conceptualizations of Food Waste**
Food and Agriculture Organization of the United Nations	"[...] the decrease in the quantity or quality of food resulting from decisions and actions by food suppliers in the chain, excluding retailers, food service providers and consumers. Empirically, it refers to any food that is discarded, incinerated or otherwise disposed of along the food supply chain from harvest/slaughter/catch up to, but excluding, the retail level, and does not re-enter in any other	"[...] refers to the decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers. Food is wasted in many ways: - Fresh produce that deviates from what is considered optimal, for example in terms of shape, size and color, is often

	productive utilization, such as feed or seed. Food loss, as reported by FAO in the FLI, occurs from post-harvest up to, but not including, the retail level." (FAO n.d.a)	removed from the supply chain during sorting operations. - Foods that are close to, at or beyond the "best-before" date are often discarded by retailers and consumers. - Large quantities of wholesome edible food are often unused or left over and discarded from household kitchens and eating establishments." (FAO n.d.a)
Swedish Food Agency (Livsmedelsverket)	"[…] food that could have been eaten, but for some reasons has not been […]" (Swedish Food Agency 2021)	"[…] food that could have been eaten, but for some reasons has not been […]" (Swedish Food Agency 2021)
Annosi et al. (2021)	-	"[…] the food lost during any of the four main phases of the food supply chain, from upstream to downstream, involving the following actors: producers, processors, retailers, and consumers […]" (Annosi et al. 2021: 208)
De Steur et al. (2016)	"[…] a decrease in edible food mass occurring during production, postharvest and processing […]" (De Steur et al. 2016: 360)	"[…] any raw or cooked food mass that is discarded at retail and consumption […]" (De Steur et al. 2016: 360)

As seen in table 1, some FLW definitions separate food loss and food waste into two different concepts. For example, the FAO´s (n.d.a) definitions. Other definitions conceptualize FLW under one definition, for example the Swedish Food

Agency´s (2021) definition. However, common for all these definitions is that FSCs stages are incorporated into the conceptualizations. The FSC stages are usually divided into food loss; referring to the production through supplier stages, and food waste; referring to the retailer and consumer stages. This can be seen in both FAO´s (n.d.a) and De Steur´s et al. (2016) definitions. Annosi et al. (2021) incorporate FSC stages into their definition as well, but do not acknowledge food loss as a concept.

The FAO is one of the highest-level global organizations that has provided definitions for FLW, which many nations and organizations base their sustainability targets on (FAO n.d.a). Therefore, in this study, FLW is defined according to FAO´s definitions, in order to be connected to SDG 12.3 as discussed in section 1.1. The researchers believe that this is a good platform, where various actors come together and find a consensus in common goals. However, for simplicity reasons, both definitions will be included under one concept: FLW. Thus, FLW in this study refers to both FAO's (n.d.a) definition of food loss and food waste. This is preferable for simplicity reasons since the study focuses on the supplier-retailer interface. In other words, the study is conceptually positioned in the middle of the division of the FSC stages mentioned above in regard to food loss and food waste.

2.2 Food Supply Chains

A supply chain can be referred to as a type of resource movement. Mentzer et al. (2001), for example, define a supply chain as a flow between actors which are a part of upstream or downstream processes of products or services, delivered to end-customers. A supply chain also involves complex flows of other types of resources, such as information or money (Plenert 2007). Previous research stresses supply chains as constantly evolving (Im et al. 2019). For example, actors can be replaced or added in supply chains (ibid.). Similarly, multiple studies describe specifically FSCs consisting of several actors, with the purpose to harvest, produce, package and deliver a final food product (Nosratabadi et al. 2020; Vodenicharova 2020; Yazdani et al. 2021).

Nosratabadi et al. (2020) describe the main actors in FSCs to include farmers, processors, suppliers, distributors, retailers and consumers. Since they involve different types of actors; from small farmers to multinational companies in different geographics etc., FSCs are complex in practice (Mena et al. 2011). Common for the role of suppliers in FSCs is to provide retailers downstream with various products, packaging, or services (Beckeman & Olsson 2011). The scope of this study; the supplier-retailer interface, is illustrated in figure 2 below.

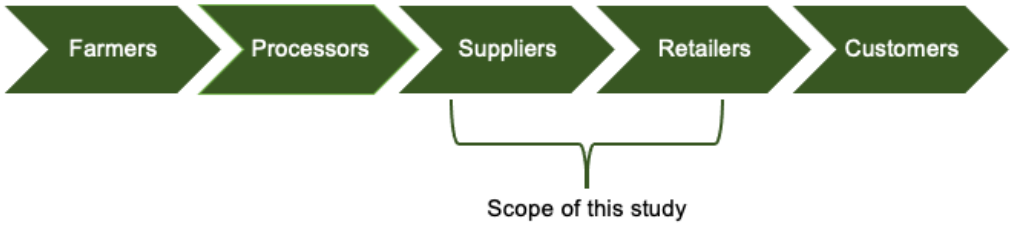

Figure 2. The Main Stages of a Food Supply Chain. Own Illustration.

2.3 Food Loss and Waste in Bread Supply Chains

Bread is one of the most wasted food products in Europe (Iakovilera 2021). Brancoli et al. (2019) investigated FLW in Swedish bread supply chains and found that every year about 80 410 tons of bread is lost or wasted in these supply chains. Most of the FLW occurred at the consumer level, however, significant FLW also occurred in the bakery-retailer interface after production (see figure 3 below).

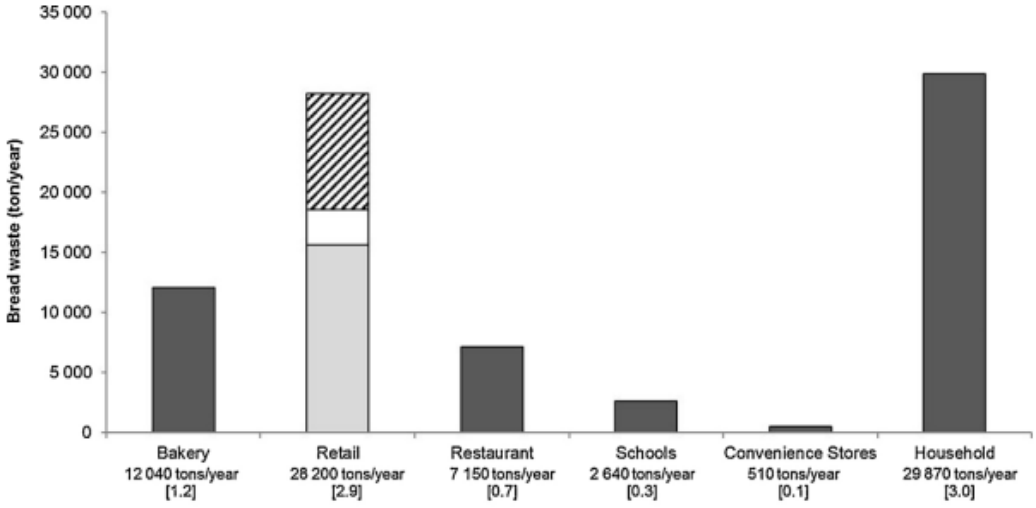

Figure 3. Bread Waste Generated Yearly in Different Parts of the Value Chain in Sweden (Brancoli et al. 2019: 132).

The Swedish bakery sector is dominated by three large companies (see table 2 below) (Iakovilera 2021). Additionally, not included in the table, local bakeries have a market share of about 10 %, traditional bakeries ("that bake and sell their bread in their own stores" (Iakovilera 2021: 16)) have a market share of 2-3 %. Further, about 5 % of the market shares is accounted for by retailers producing their own bread (ibid.).

Table 2. Market Shares in the Swedish Bakery Sector (Iakovilera 2021: 16).

Company /Bakery	Market share (%)
Pågen	38.4
Fazer	18.4
Polarbröd	23.1
Private labels	8.5
Others	11.6

One cause to FLW in bread supply chains is errors in production or management (Iakovlieva 2021). For example, technical faults in production or packaging causing products not to pass the quality standards. Another cause is human errors, such as incorrect orders due to poor forecasting or lack of information prior to ordering (ibid.). Similarly, Mena et al. (2011) mean that poor management could lead to lacking information exchange between suppliers and retailers; creating variations in forecasts, ordering, supply and demand. Further, inconsistent or changing customer demand also causes FLW (Mena et al. 2011; Iakovlieva 2021). Iakovlieva (2021) describes over-ordering as a strategy to meet customer demand, or as a market strategy; for example, by displaying newly-baked bread in stores to increase sales (ibid.). Mena et al. (2011) also identify food products and processes characteristics as another cause of FLW. For example, some products have a short shelf-life (ibid.). In fact, they found that some retailers did not accept products with less than 70 % shelf-life time remaining. This is especially true for fresh bread, having 1-2 days of shelf-life time, meaning that minor forecasting errors or other externalities such as weather fluctuations, could result in FLW (ibid.).

Another cause for FLW of bread in Sweden is retailers' high market shares (Ghosh & Eriksson 2019). In Sweden, take-back agreements or reclamation policies are common (elaborated on as a SCC challenge in section 2.3.3.). Briefly, this means that suppliers are responsible for handling unsold bread. While these agreements could be used for creating cradle-to-cradle, rather than cradle-to-grave, supply chains (Eriksson et al. 2017), most previous research view these agreements as problematic (Ismatov 2015; Eriksson et al. 2017; Brancoli et al. 2019). Brancoli et al. (2019) even identify take-back agreements as a risk-factor to FLW. FLW.

2.4 Supply Chain Collaboration

In a market and business context, the conceptualizations of collaboration in supply chain management literature are wide-ranging, resulting in multiple definitions of collaboration (Ramanauskas et al. 2021). Ramanauskas et al. (2021: 701) refer to collaboration as "[...] organizations or companies working together to reach particular objectives […]." They further argue that in order to reach mutual

objectives, active participation of all collaborative partners is required (ibid.). Similarly, Simatupang and Sridharan (2002: 19) state that collaboration occurs when "[...] two or more independent companies work jointly to plan and execute supply chain operations with greater success than when acting in isolation." Also, Im et al. (2019) describe collaboration between actors as naturally changing and evolving over time. As such, in this study and in a market and business context, collaboration is defined as actors working together for a joint purpose.

Departing from the concept of collaboration, supply chain collaboration (SCC) has developed as a concept in supply chain management literature. According to Cao and Zhang (2011), SCC has two focus areas: a process and a relationship focus. Similarly, Chan and Prakash (2012) highlight that SCC can be divided into process integration and creation of relational communication and knowledge. The process-side focuses on the business perspective of collaboration, where actors work together to reach mutual goals. In contrast, the relationship-side highlights the partnership of the collaboration (Cao & Zhang 2011). Accordingly, Cao and Zhang (2011: 166) define SCC as "[...] the formation of close, long-term partnerships where supply chain members work together and share information, resources, and risk to accomplish shared objectives." Other studies have likewise defined SCC as two or more actors within the same supply chain working together to meet market demands (Matopoulos et al. 2007) and as "[...] companies and/or organizations working together to solve problems and/or achieving common goals" (León-Bravo et al. 2018b: 3). In line with these definitions, this study defines SCC as a social process between at least two actors in a supply chain, working together for a joint purpose. In order to better understand SCC and to answer the research questions, the researchers have conceptualized SCC consisting of three themes: SCC practices, motives and challenges. These are together referred to as SCC preconditions and occur between actors collaborating within a supply chain. They will be elaborated on in the following sections.

2.4.1 Supply Chain Collaboration Practices

In previous research on SCC, several recurring and interrelated SCC practices have been identified, including literature both specifically focused on FLW as well as in other contexts. Cao and Zhang (2011), Wee et al. (2016), León-Bravo et al. (2018b) and Mofokeng and Chinomona (2019), are some studies highlighting similar practices in SCC, taking place upstream and downstream in a supply chain. In line with the above mentioned research, this study views SCC practices as joint activities that realize and frame SCC. Departing from these studies, the main SCC practices that this study focuses on are *resource sharing, joint decision making, incentive sharing, mutual goals, joint knowledge creation* and *communication*. The

SCC practices are summarized in table 3 below, and thereafter elaborated on in the following sections.

Table 3. Summary of Supply Chain Collaboration Practices found in Previous Research. Own Conceptualization.

Supply Chain Collaboration Practices	**Conceptualization**
Sharing of Resources	Includes sharing and combining tangible and/ or intangible resources. One example of tangible resources is material, whereas intangible resources could be information. Sharing of information is key for a successful SCC.
Joint Decision-Making	Through SCC, actors can make joint decisions that are more precise, informed and effective than they would have been able to make on their own. The aim of joint decision-making is to optimize supply chain operations, for example by making more accurate forecasts.
Incentive Sharing	Refers to actors taking collective responsibility for SCC outcomes. Thus, balancing tasks, resources, benefits, risks and costs in a collaboration.
Mutual Goals	Focuses on aligning the overall goals in a SCC, with actors' individual goals. Thus, a common agreement of the SCC characteristics is needed, such as the definition of roles, measures and responsibilities.
Joint Knowledge Creation	By searching and acquiring new and relevant knowledge, actors in a SCC can gain a better understanding of the market. Thus, better respond to external changes and competition.
Communication	Vital to develop and maintain a SCC. Communication also enables SCC practices to take place. Communication can be formal or informal and addressed directly or indirectly to change actions or behaviors.

Resource Sharing

As explained by Zacharia (2009) collaborative partners can, as a type of SCC practice, share and combine different tangible and intangible resources. Cao and Zhang (2011: 166) describe resource sharing as "[...] the process of leveraging capabilities and assets and investing in capabilities and assets with supply chain partners." Sharing of tangible resources could, for example, include sharing of inventory, material (Ma et al. 2019), technology or manufacturing equipment (Cao & Zhang 2011). Contrary, sharing of intangible resources includes sharing of information, time, training and financial investments (Cao et al. 2010; Nyaga et al. 2010; Wee et al. 2016). Several studies stress information sharing as a key SCC

practice (Simatupang & Sridharan 2004; Aggarwal & Srivastava 2016; Wee et al. 2016; Dania et al. 2018). Shau et al. (2006) even frame information sharing as a required for collaborative relationships and for successful SCC performance. Information sharing could include sharing customer feedback, transactional data (Wee et al. 2016), inventory levels, planning and forecasting (Ma et al. 2019).

Joint Decision-Making

Information sharing is connected to joint decision-making, because distributing information among actors is needed to make informed, accurate and effective joint decisions (Simatupang & Sridharan 2008; Ma et al. 2019). Wee et al. (2016: 5) explain joint decision-making as: "[...] the process of supply chain partners synchronizing their decision-making process in supply chain planning and operations with the purpose of supply chain benefit optimization.". Similarly, Cao and Zhang (2011) describe joint decision-making as a practice to optimize the supply chain. For example, by making more accurate forecasts (ibid.).

Incentive Sharing

According to Wee et al (2016), incentive sharing refers to balancing the sharing of tasks, resources, benefits and costs, with the aim of establishing SCC interdependence. Thus, leading to actors taking collective responsibility for collaborative outcomes (ibid.). Similarly, Matopoulos et al. (2007), Cao and Zhang (2011) and Dania et al. (2018) highlight the importance of balancing sharing activities appropriately within a SCC. More specifically, Simatupang and Sridharan (2004) highlight that sharing costs, risks and benefits is important to ensure that all collaborative partners are committed and motivated to maintain the SCC. If there is an unequal distribution it could cause conflicting interests, where focus instead lies on maximizing individual gains, which often reduces SCC performance (Simatupang et al. 2002). As a result, incentive sharing enables other SCC practices to be executed (Simatupang & Sridharan 2008). For example, joint decision-making and information sharing (ibid.). Therefore, as highlighted by Barrat (2004), a mutual understanding of the collaboration is important.

Mutual Goals

Mutual goals are about aligning overall SCC objectives with actors' individual goals (Cao & Zhang 2011; Wee et al. 2016). Yan and Dooley (2013: 525) elaborate on this further: "[...] the extent to which buyer and supplier groups perceive the possibility of achieving compatible, if not identical objectives." To achieve this, a common agreement of the collaboration's characteristics is needed, such as definition of roles, measures and responsibilities (Wee et al. 2016). In relation to this, actors' individual needs and expectations on the collaboration must be considered, to improve all members' gain on the collaboration (ibid.). Thus, creating incentive sharing, as explained in the previous section. Mutual goals could also

have a positive effect on joint decision-making, as joint goals could create shared interests between collaborative actors (Yan & Dooley 2013).

Joint Knowledge Creation

Joint knowledge creation is about acquiring a better understanding of the market through SCC (Cao & Zhang 2011). For example, regarding competition and market changes (ibid.). Joint knowledge creation refers to finding new knowledge, which should be spread and interpreted amongst SCC members (Cao et al. 2010). This explanation of joint knowledge creation is further elaborated by Wee et al. (2016), who divide knowledge creation into knowledge exploration and knowledge exploitation. Knowledge exploration refers to "[...] the search and acquisition of new and relevant knowledge", and knowledge exploitation refers to "[...] assimilation and application of relevant knowledge" (Wee et al. 2016: 4). Knowledge creation therefore occurs when acquiring knowledge relevant to the collaboration (ibid.) This requires active involvement of all collaborative partners (Cao et al. 2010).

Communication

Chan and Prakash (2012) highlight communication as an important practice to develop and maintain SCC. Communication could therefore enable other SCC practices to take place. For example, communication enables resource sharing and determines the level of involvement in joint decision-making (Fynes et al. 2005).

In practice, communication consists of exchanged contracts and messages (Cao & Zhang 2011). Further, Cao et al. (2010) explain communication as either formal or informal. Formal communication has many distinct rules, whereas the latter refers to more unstructured dialogues. Communication can also have a direct influence on collaborative partners, referring to actors straightforwardly asking their partners to change actions or behaviors. In contrast, uninfluenced communication is changing a partner's behavior without openly expressing it. Further, a two-way communication that is open, balanced and exists between different operations is important to enable a close SCC (ibid.). Similarly, Forslund and Jonsson (2009) argue that communication must be practiced directly between the responsible and involved functions and/ or individuals. For example, sales and purchasing functions should preferably communicate directly with each other (ibid.). Additionally, communication must be recurrent, relevant and timely to align expectations and reduce conflicting interests (Fynes et al. 2005). Thus, for a successful SCC to take place, it is important that all actors, to somewhat the same extent, engage in communication (ibid.).

2.4.2 Supply Chain Collaboration Motives

Even though actors can have different individual motives as to why they choose to engage in a SCC (Ramanathan 2014), some common motives have been found in previous research: *increased supply chain knowledge*, *improved business performance* and *solving problems in supply chains* (Matopoulos et al. 2007; Simatupang & Sridharan 2008; Wee et al. 2016; León-Bravo et al. 2018b; Im et al. 2019; Ma et al. 2019; Mofokeng & Chinomona 2019). These motives are summarized in table 4 below, and thereafter elaborated on in the following sections.

Table 4. Summary of Supply Chain Collaboration Motives found in Previous Research. Own Conceptualization.

Supply Chain Collaboration Motives	**Conceptualization**
Increased Supply Chain Knowledge	SCC can reduce uncertainties connected to actors' businesses by having more supply chain knowledge. For example, increased knowledge about other actors' behaviors and decision-making processes.
Improved Business Performance	SCC can improve economic, social and environmental performances. For example, costs can be reduced and customers' needs can more efficiently be met, which could lead to increased profits.
Solving Problems in Supply Chains	Actors have to solve both present and future supply chain problems. These problems can affect actors individually and several supply chain stages. SCC enables actors to find solutions to supply chain problems by inviting more actors into the problem-solving process.

Increased Supply Chain Knowledge

One motive as to why actors develop and engage in SCC is to improve the limited knowledge actors have about each other in a supply chain (Wee et al. 2016). Limited knowledge could be risky, as it creates uncertainties regarding other actors' behaviors and decision-making processes (León-Bravo et al. 2018b).

Several studies, such as Nyga et al. (2010), highlight information sharing as a way to increase supply chain knowledge. For example, actors can learn more about each other's routines (ibid.). In addition, sharing information and having better knowledge and capabilities at hand enables actors to better plan, control and coordinate SCC operations and make more accurate and effective decisions (Simatupang & Sridharan 2008; Dania et al. 2018; Ma et al. 2019; Mofokeng & Chinomona 2019; Bhattacharya & Fayezi 2021). Increased knowledge could also

spark the development of new products and meeting customer needs (Cao et al. 2010).

Improved Business Performance

Increased globalization and market competitiveness have increased actors' need to collaborate, in order to improve their businesses (Kumar et al. 2017) and be competitive, for example in social and environmental areas (Matopoulos et al. 2007; Cao & Zhang 2011; Ramanathan 2014; Wee et al. 2016; León-Bravo et al. 2018b). For instance, Aggarwal and Srivastava's (2016) study showed that collaboration between a supplier and retailer in a FSC improved waste reduction, which in turn also increased profits (ibid.). Previous research also highlights that SCC can reduce costs (Ramanathan, 2014; Ma et al. 2019). For example, by jointly planning production and inventory levels (Ma et al. 2019). This would enable supply chain operations to be more efficiently adjusted to meet customers' changing needs, and thereby increase profits (McLaren et al. 2002). Further, this could also lead to an expansion of the customer base (Ramanathan 2014). In turn, this would improve the overall SCC performance (Dania et al. 2018). Hence, this study finds that SCC can improve actors' individual business performances, but also performances between several supply chain stages, indicating a motive for SCC.

Solving Problems in Supply Chains

As explained by Im et al. (2010), actors must simultaneously solve present and future problems in the supply chain. Further, an actor's individual problems might also affect other stages in the supply chain, and vice versa (ibid.). To this end, collaboration is suggested as a way for actors to find better solutions to supply chain problems (ibid.). Chan and Prakash (2012) and Matopoulos et al. (2007) elaborates on this, and argued that common problems could be better solved by joint decision-making. This could also lead to finding more innovative solutions to problems (Min et al. 2005). New distributing processes, as one example, could decrease costs both for the supplier and retailer (ibid.). Similarly, Cao and Zhang (2011) stress that SCC helps avoid market problems. Additionally, setting mutual goals to solve existing problems can improve actors' incentives to work together (Im et al. 2019). For example, by sharing more knowledge or resources amongst one another (ibid.).

2.4.3 Supply Chain Collaboration Challenges

Complexity in supply chains, power asymmetries in supply chains, lack of trust between actors, unwillingness to share resources and *value differences between actors* are recurring SCC challenges found in previous research. They impact how well SCC practices can be performed as well as collaboration outcomes (Sheu et al. 2006; Matopoulos et al. 2007; Ramanathan 2014; Dania et al. 2018; Panahifar et al.

2018; Mofokeng & Chinomona 2019). The challenges are summarized in table 5 below, and thereafter elaborated on in the following sections.

Table 5. Summary of Supply Chain Collaboration Challenges found in Previous Research. Own Conceptualization.

Supply Chain Collaboration Challenges	**Conceptualization**
Complexity in Supply Chains	The structure of a supply chain is by nature complex. SCC further expands this complexity by adding new relationships that need to be considered. Complexity also increases as SCC varies depending on where in the supply chain it takes place and by the number and characteristics of the collaborative partners.
Power Asymmetries in Supply Chains	Retailers are usually few and have large market shares, resulting in them having higher bargaining power compared to suppliers. This enables retailers to behave in ways that result in a surplus of food. Retailers lack economic incentives to change the way they exercise their power, in turn leading to little behavioral change.
Lack of Trust between Actors	Trust makes it easier for actors to be transparent, committed and share information with each other. Thus, trust is needed to establish and maintain a collaborative relationship successfully. In contrast, lack of trust can inhibit collaborative practices to take place and strain the functioning of SCCs.
Unwillingness to Share Resources	Sharing of resources, such as information, could be especially difficult for actors at the end of supply chains, due to fear of opportunistic behavior. This influences the amount of shared resources between retailers and suppliers, and therefore also impacts the functioning and success of SCCs.
Value Differences between Actors	Actors' values must be aligned to enable SCCs. Values that are not aligned challenge the functioning of a collaboration, because it could result in different expectations, intentions and behaviors of the collaboration.

Complexity in Supply Chains

Chan and Prakash (2011) identify the supply chain context to be complex. Environmental issues and FLW are also found to be complex (Bhattacharya & Fayezi 2021). Hence, solving FLW through SCC could be a challenging task. Similarly, Ramanathan (2014) argues that SCC could increase the already complex structure of the supply chain. This as SCC increases the number of relationships in the supply chain, having various needs and demands that must be considered (ibid.). León-Bravo et al. (2018b) also argue that SCC creates “extra” relationships, which

need to be managed. Further, SCC varies in different supply chain stages due to the characteristics of actors involved. For example, their size and power (ibid.). All of this is also challenging for SCC (ibid.). As such, Vachon and Klassen (2008) argue that collaborating to solve environmental challenges, for example FLW, requires complex solutions. This is due to the many "interactions between firms and their supply chain networks, regulators, and the public" (Vachon & Klassen 2008: 310). The complexity could also increase if a FSC actor have several collaborations (Matopoulos et al. 2007). For example, if a supplier collaborates with a restaurant and a grocery store, and therefore must adjust to different collaborative demands (ibid.). This study therefore views complexity in supply chains as a SCC challenge.

Power Asymmetries in Supply Chains

Power asymmetries in supply chains was identified as a trend to be brought up in previous research, focusing on FLW in the supplier-retailer interface in FSCs, especially in Swedish bread supply chains. Retailers inhibit more bargaining power than suppliers, enabling them to behave in ways that promote suppliers to oversupply, and thus producers to overproduce (Eriksson et al. 2017; Brancoli et al. 2019; Ghosh & Eriksson 2019). This results in a surplus of food and FLW to occur (ibid.). According to Devin and Richards (2018), retailers have high bargaining power because farmers or producers usually do not have many other selling alternatives. Further, exporting would push the price down as well, so suppliers have to agree to skewed contracts developed to benefit retailers' needs and flexibility. Further, the benefits associated with the high bargaining power leads to less incentives for large retailers to behave differently (Canali et al. 2017).

In previous research, one way Swedish bread retailers exercise their bargaining power is through *take-back agreements* (Ismatov 2015; Eriksson et al. 2017; Brancoli et al. 2019). Take-back agreements caused over 50 % of bread to be lost or wasted in Sweden in 2019. This illustrates the significance of take-back agreements in Swedish bread supply chains, also in line with previous research arguing that these agreements are highly problematic in regard to FWL (Ghosh & Eriksson 2019). Take-back agreements refer to products not sold by a retailer being returned to the supplier without cost, where the responsibility lies on the suppliers to deal with that surplus. Ghosh and Eriksson (2019) accessed sensitive data from a company in the bread industry that showed take-back agreements having resulted in 30 % returns from the retailers, which the company had to bear the costs for. According to their research, only large sized suppliers had the bargaining power to negotiate contracts more apt for the supplier, while small and medium sized suppliers must accept take-back agreements (ibid.). Further, Brancoli et al. (2019) state that when the responsibility and cost of FLW is pushed back in FSCs, retailers are not incentivized to improve operations and make more correct orders. Retailers simply lack economic incentives to reduce FLW (Ismatov 2015).

Lack of Trust between Actors

Trust is found in previous research as a factor impacting SCC actors' relationships. Thus, lack of trust strains collaboration. Although there is no set definition for trust, the definitions found in previous research are similar to each other. For example, Sheu et al. (2006: 26) state that trust "[...] exists when a party believes that its partner is reliable and benevolent." According to Dania et al. (2021: 2) trust "[...] reflects the willingness to rely on others to attain mutual benefits." Lastly, Panahifar et al. (2018) define trust by dividing it into three characteristics: reliability, predictability and fairness.

Matopoulos et al. (2007) identify trust as vital to establish and maintain a relationship. In fact, many researchers state that trust is key for collaboration. Dania et al. (2018) argue that trust is needed for SCC to develop, and high trust between actors will lead to more opportunities and possibilities to collaborate successfully. Similarly, Panahifar et al. (2018) argue that trust is the foundation of collaboration, and that it fosters commitment, information sharing and transparency. Further, trust affects a collaboration's intensity, depth and width (ibid.). Hence, trust is found as key for successful collaborations. This study therefore views lack of trust as a SCC challenge.

Unwillingness to Share Resources

As already mentioned, sharing resources in SCCs can impact actors' competitive advantage (Ma et al. 2019; Mofokeng & Chinomona 2019), sustainability performance (León-Bravo et al. 2018b) and the overall functioning of a SCC (Ma et al. 2019). Hence, being willing or unwilling to share resources may determine SCCs outcomes and success.

Competitiveness between actors is problematic in regard to SCC sharing practices (Bwimba, 2019; Bhattacharya & Fayezi, 2021). Iakovlieva (2021) and Eriksson et al. (2017) found that FLW information, such as volumes and cost, are considered firm secrets and could risk actors' competitiveness. While a failed SCC could lead to lost investments and time delays, it could also make a collaborative partner to instead become a competitor (Ramanathan 2014). This, as actors acquire knowledge and information about each other in collaborations (ibid.). Hence, there are both trust and transparency issues in supply chains that make SCC practices, especially information sharing, difficult (Iakovlieva 2021).

In FSCs, information sharing could be especially challenging for retailers as they are at the end stage of supply chains (Mohtadi 2008). Retailers possess valuable information about end-customers. On one hand information sharing could improve supply and demand levels, but it could also open up for suppliers to act opportunistically. Accordingly, retailers with many suppliers are more likely to

share information upstream in a FSC (ibid.). Thus, the fear of opportunistic behavior influences the amount of shared information (ibid.). Thereby, there are many reasons supporting actors' unwillingness to share resources within a SCC. Sharing resources is at the same time very important for a successful SCC, making it an important issue and a SCC challenge.

Value Differences between Actors
An actor's collaboration values, such as commitment, culture, mutual understanding and view of relationships, have been found to be very important for a SCC. It affects the trust and the relationships in SCCs, as well as the coordination and communication between the actors (Dania et al. 2018). Thus, actors' values could be viewed as the ground rules for SCC, and if the values among collaborative partners differ that would challenge the collaboration.

Included in the values is commitment. Commitment refers to an actor's intentions and dedication to maintain a collaborative relationship long-term (Dania et al. 2018). It therefore impacts SCC objectives. It also affects actors' willingness or unwillingness to share sensitive information and other resources (ibid.). According to Sheu et al. (2006), committing and sharing resources, thus investing in the collaboration, is a key demonstration of commitment. Therefore, commitment can affect the stability of SCC; and a stable collaboration is a well-functioning collaboration. In a stable relationship, actors actively adjust and work together to accommodate and sustain the SCC (Dania et al. 2018). As such, not expressing a SCC commitment will restrict collaborations' success and stability.

Also, mentioned previously, SCC sometimes involves practices that could open the possibility for opportunistic behavior (Mohtadi 2008). Hence, values are important to align actors' expectations of the SCC's scope, intentions, behaviors and outcomes. If not, the SCC may become dysfunctional and disappointing for the collaborative partners.

2.5 Conceptual Framework of the Study

As described in the previous sections, this study defines SCC as a social process between at least two actors in a supply chain, working together for a joint purpose. By reviewing previous research several SCC practices, motives and challenges were identified. As a first step, these need to be considered to understand collaboration from the suppliers´ perspective on the one hand, and from the retailers´ perspective on the other hand. Thereafter, these are together viewed to increase the understanding of *SCC preconditions* in the supplier-retailer interface to reduce FLW. The conceptual framework of the study illustrates this process (see

figure 4 below), and is used to address the research questions and fulfill the study's aim: *to increase the understanding of preconditions for SCC between suppliers and retailers to reduce FLW*.

Since there is limited research on collaboration to reduce FLW in Swedish bread supply chains, this study will contribute to the fulfillment of the identified research gap (see section 1.3). Therefore, this study is highly relevant. To that end, the main idea of the conceptual framework is that it identifies SCC practices, motives and challenges to understand the SCC preconditions. Collaboration is thus deemed necessary to reduce FLW in bread supply chains and knowledge about the preconditions for SCC in the supplier-retailer interface is therefore needed. needed.

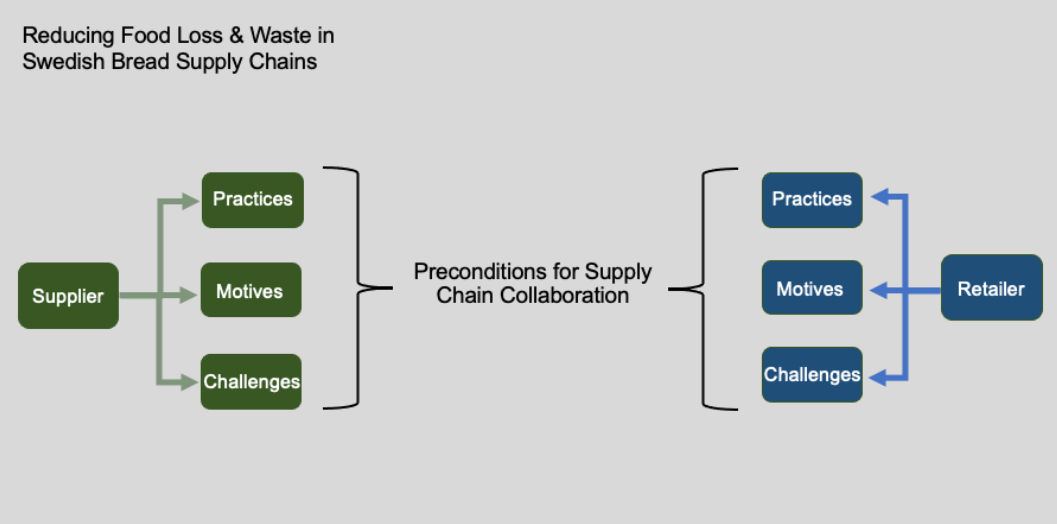

Figure 4. The Conceptual Framework of the Study. Own Illustration.

3. Method

In this chapter, the method of the research is explained and the choices regarding different aspects of the method are discussed. Specifically, this chapter includes discussion about the study's research philosophy, research approach and strategy, research design, literature search and review, sampling strategy, data collection and analysis, quality of research and ethical considerations.

3.1 Research Philosophy

The research philosophy of social sciences builds on the researchers' ontological and epistemological views (Bell et al. 2019). It impacts the study's methodology, as the ontological and epistemological assumptions shape how research preferably should be conducted. In turn, the methods of the study reflect the assumptions of the chosen methodology. Due to the impact the research philosophy has on the study; framing its point of view, assumptions, and beliefs (ibid.), it is important to identify so that readers can understand and analyze it from their point of view. Bell et al. (2019) describe that ontology refers to how one views and observes reality. Epistemology refers to what humans consider being knowledge and how knowledge can be gained (ibid.). Therefore, the ontology and epistemology affect the research's discourse and set up, and how researchers perceive the research.

This study is based on a constructivist ontological position. According to Bell et al. (2019), this position means that social phenomena are social constructs of social actors. In other words, social phenomena are continuously changing, or not changing, because of the social actors shaping them. The opposing position is objectivism. According to objectivism, social phenomena exist independently from social actors (ibid.). The researchers of this study believe that SCC (being the social phenomena under investigation) is highly dependent on different types of social entities and actors; supply chains, organizations and people, in regard to the functioning and success of the collaboration. Therefore, the research is positioned in constructivism.

Further, the epistemological position of this research is interpretivism. Briefly, interpretivism could be described as striving to understand, rather than explain,

human behavior and institutions (Bell et al. 2019). As described by Bell et al. (2019) interpretivism was developed underpinning that we cannot approach the social world in research the same way as in natural sciences. Contrary there is positivism that supports the same application of research methods on the social world as in natural sciences (ibid.). Further, according to Saunders et al. (2019), interpretivism opposes the positivist view that there are universal laws applicable in the same way to all people in the social world. Instead, according to an interpretivism position, "different people of different cultural backgrounds, under different circumstances and at different times make different meanings, and so create and experience different social realities" (Saunders 2019: 140). Interpretivism is thus a way to interpret and understand people and the social world by embracing its "complexity, richness, multiple interpretations and meaning-making" (Saunders 2019: 141). For this study, the interpretivism position was therefore desirable because SCC is addressed as a social construct; created, shaped and experienced by people, making it difficult to separate SCC from its social context. People build up organizations, and organizations build up supply chains, therefore; SCC is occurring because of people. As a result, the only ones who can truly understand SCC are the people who are part of these social constructs. Thus, data needed to be collected from these people and analyzed in this context in order to gain understanding of SCC. This realization permeates the method-chapter.

3.1.1 Research Approach

There are three different ways to approach the theory development of the research; the inductive, deductive or abductive approach. Malhotra (2017) describes the inductive approach as moving from data to theory. This means that the research starts by collecting data, and thereafter patterns and themes in the data are analyzed. From those discoveries, theory would be developed. The deductive approach instead starts from theory. From the theory, hypotheses are developed, and then data is collected to test the hypothesis and theory (ibid.). Neither of these research approaches were applicable to this study. This study started by investigating theory to identify a research problem (FLW in the supplier-retailer interface in bread supply chains), as well as developing a conceptual framework that potentially could solve the research problem. Hence, how this found concept (SCC) would work empirically is a research gap. Thus, this research collected data regarding the social phenomenon SCC in its empirical context. While there is no set theory, theory (from which the conceptual framework SCC was developed) was used to organize and analyze the data. This means that SCC was used as a tool for guidance in answering the research questions. As explained, this research departed from both theory and data. Saunders et al. (2019) describe the abductive approach involving moving back and forth between data and theory, like a mix between the inductive and deductive approaches (ibid.). Further, Malhotra (2017: 175) explains the aim of the abductive

strategy to “describe and understand social life in terms of social actors´ meanings and motives.” The abductive approach was therefore suitable for this research.

3.1.2 Research Strategy

The research strategy refers to the methodology of the research, hence, the orientation of how the research should be conducted (Bell et al. 2019). Bell et al. (2019) describe two different research strategies; quantitative and qualitative. Maybe the most commonly known difference between the qualitative and quantitative research strategies are the type of data they emphasize; quantitative data for quantitative research and words and images as data for qualitative research. Another difference is that quantitative research approach usually is associated with testing theories, and qualitative research with generating theory. However, the research strategies also differ in philosophical assumptions and approach to theory development (Bell et al. 2019). For example, quantitative research is usually associated with objectivism, positivism and the deductive approach. Instead, qualitative research is usually associated with constructivism, interpretivism and the inductive approach. It should be noted that the two strategies should not be distinctly separated, as there are many examples of studies using the strategies differently than described above (ibid.).

Moreover, Hammarberg et al. (2016) explain that qualitative research is appropriate with research questions seeking answers in experiences, perspectives, and meanings. This is relevant for all research questions of this study, but especially question two (investigating motives, hence, perspectives and meanings) and three (investigating challenges, hence, perspectives and experiences). The researchers believe that in order to fulfill the study’s aim and answer the research questions, the data collected needs to be qualitative; rich and in-depth. Therefore, the research used a qualitative research strategy.

3.2 Research Design

According to Bell et al. (2019: 45), “a research design provides the framework for the collection and analysis of data.” There are many different research designs, such as the experimental design, the cross-sectional design, the longitudinal design, the case study design and the comparative design. They differ in focus and priority of variable connections, generalizations, context and time etc. (ibid.).

In this study, there is specifically a focus on the context (the supplier retailer-interface in Swedish bread supply chains). This guided the researchers towards the case study research design. Since case studies are limited to specific boundaries, it makes it possible to examine a case thoroughly and access rich and detailed data,

opening up for the possibility of working with qualitative data (ibid.). Similarly, according to USC Libraries (2022), a case study design enables researchers to gain in-depth understanding of a particular research problem rather than one having a comprehensive context. It is beneficial for studies striving to strengthen knowledge from previous research and apply concepts into real-life situations (ibid.). As such, the case study design seemed very suitable for this study; applicable to the specific studied context and enabled collecting qualitative data to fulfill the aim and answer the research questions. However, a weakness of case studies is how to strengthen the study's validity, reliability and replicability (Bell et al. 2019). For example, it is often questioned how a unique case could be generalized and its findings applicable to other cases (ibid.). Briefly, this study approached this issue attempting to be as transparent as possible regarding how the study has been conducted. This allows the reader to create its own perception of the study´s trustworthiness. This is further discussed in section 3.7.

Cases in case studies are usually defined as single organizations, locations, events or people (Bell et al. 2019). There are also multi-case studies, involving more than one case (ibid.). This study has four respondents belonging to different companies, making it a multi-case study of four cases. Two of the respondents are suppliers and the other two are retailers in bread supply chains. The respondents were thus acting as informants for the supplier and retailer side of SCC in the supplier-retailer interface. In addition, a multi-case study may also enable comparative and contrasting analytical insights between the cases (ibid.), in this study; between the suppliers and retailers. Hence, this study's research design is a multi-case study.

3.2.1 Unit-of-Analysis and Unit-of-Observation

In accordance with this study's conceptual framework and research philosophy, SCC is defined as a social process between at least two actors in a supply chain, working together for a joint purpose. Further, the study conceptualizes SCC into SCC practices, motives and challenges; together creating SCC preconditions. Therefore, the researchers have identified the unit-of-analysis in the study to be SCC practices, motives and challenges. In turn, the unit-of-observation are individuals, as people are the ones creating, shaping, and experiencing SCC within the supplier-retailer interface in Swedish bread supply chains.

3.2.2 Time Frame of the Study

Creswell (2013: 97) describes a case study as "the study of a case within a real-life, contemporary context or setting." Hence, it is bound by, for example, time and place (ibid.). Additionally, Bell et al. (2019: 79) describe that "all research is constrained by time and resources." While the case of this study has already been defined, the time frame of the study has not yet been addressed. Bell et al. (2019) highlight the

importance of time management when conducting a study, suggesting the development of a timetable. Hence, attached in Appendix 1, this study's timetable is illustrated, which the researchers followed almost precisely. Due to the chosen research approach (the abductive approach), the researchers went back and forth between theory and data. Thus, all chapters were continuously worked on and sometimes redeveloped throughout the research process.

Moreover, this study is a master thesis conducted for the Swedish University of Agricultural Sciences. Hence, the researchers had to adapt to the university's master thesis statutes. In regard to time and resources, this meant a 20-week time frame, in which all activities to complete the thesis were to be performed (January - June). Resources provided by the university included supervision and access to databases.

3.3 Literature Review and Search

Bryman and Bell (2011) argue that a literature review intends to provide an understanding of the research problem by searching and reviewing previous research in the same field. It can also work as a means to develop the theoretical and/ or conceptual framework of the research. This is done by finding relevant theories or concepts and appropriate research delimitations (ibid.).

According to Rother (2007), the two most common types of literature reviews are narrative and systematic reviews. This study conducted a narrative review. The main differences between the narrative and systematic reviews include scope and process of source selection (Rother 2007). The narrative review usually revolves around providing an understanding of a specific topic area in theory and context. The systematic review attempts to provide answers to specific research questions, explicitly stating the process of selecting sources and methods for analysis (ibid.). Further, the narrative review allows a flexible way to conduct the literature review, meaning that the study's boundaries and view of theory can change as data is collected (Bryman & Bell 2011). This kind of review is useful as it is difficult to know beforehand in what direction the data will lead the study in, when literature is limited. It also goes in line with the abductive research approach. Contrary, Bryman and Bell (2011) explain that the systematic review has a more systematic and extensive approach, which is argued to be more unbiased. Due to this study's limited time frame, the particular context of the research and limited previous research in similar contexts, a narrative literature review was conducted.

The literature review has provided this research with a point of departure and base on which the researchers problematized and limited the study´s focus. Further, it was also used to identify the study's research gap and to develop the study's aim,

research questions and conceptual framework. Most literature was found via the Swedish University of Agricultural Science´s database, called Primo. Additionally, a minority of the literature was found via Google Scholar and Google; mostly to find information at government or organizational sites. Search words included, in different constellations: food loss and waste, food loss, food waste, sustainable development, food supply chain, supply chain, collaboration, supply chain collaboration, collaboration practices, collaboration motives and collaboration challenges. The searches were filtered on peer-reviewed articles and sorted by relevance. The searches and search words were conducted using snowball sampling, meaning chosen sources and searches were guided based on what continuously was found in the literature review (Bryman & Bell 2011).

3.4 Data Collection

In this study, the method for collecting data was mainly done through semi-structured interviews. Secondary data to provide an empirical background about the interviewees was also collected from the companies´ websites as well as sustainability reports. This is in line with the study's research design; case studies, which allows for various data collection methods in order to gain in-depth understanding of the case(s) (Yin 2014).

The most common method to collect data in qualitative research is by conducting interviews (Bryman & Bell 2011). As explained earlier in this chapter, in order to acquire an understanding about the social phenomena (SCC), data needed to be collected from individuals being a part of it. Interviews were therefore suitable, as it focuses on the interviewees' perspectives and can acquire rich and detailed information (ibid.). Thus, this study collected data by interviewing representatives from suppliers and retailers in Swedish bread supply chains.

Structured, unstructured and semi-structured interviews are three different types of interviews (Bryman & Bell 2011). As the name entails, structured interviews follow a clear set of questions, which are asked in a pre-decided order (Bryman & Bell 2011). Structured interviews are often used in quantitative research and are suitable when aiming to acquire as little differences between the interviews as possible (ibid.). Contrary, unstructured interviews enable flexibility, and the interviews are somewhat like a dialogue, not following a specific list of questions. This approach is preferable to gain insights in the respondents' perceptions and world views (ibid.). Flexibility is also a key component in the third interview style; semi-structured interviews, which enables researchers to focus on different issues or topics that arise during the interviews (Bryman & Bell 2011; Kallio et al. 2016). At the same time, the interviews follow somewhat the same structure, and a more structured approach

is preferable if the study's scope and analysis of data in large parts has been decided upon beforehand (Bryman & Bell 2011). The semi-structured approach was appropriate for this study because the study is qualitative and there was an interest to acquire different insights and perspectives on SCC. At the same time the study also used the conceptual framework, departing from SCC as a tool for analysis (figure 4). Further, while the study's aim was decided on in the beginning of the research process, some details, such as its delimitations, were developed or changed overtime. This further strengthened the choice of semi-structured interviews as the method for collecting data.

Researchers conducting semi-structured interviews have to be aware that preparing, setting up, conducting and analyzing interviews take a lot of time, and a large amount of collected data makes the processing of it extensive (Adams 2015). To avoid this issue, the researchers started with the preparation stage early on, enabling possibilities to schedule the interviews in the middle of the study's time frame (see Appendix 1). Even though the semi-structured interviews were time consuming, the researchers found it valuable for the study's aim. As explained by Galletta and Cross (2013: 25), semi-structured interviews "[...] pays attention to lived experiences while also addressing theoretically driven variables of interests." Also, it is useful to address the complexity of the studied topic (ibid.). Thus, enabling exploration of the respondents' perceptions of SCC.

3.4.1 Interview Guide

Questions are decided beforehand in a semi-structured approach (Kallio et al. 2016). An interview-guide that divides the questions into different topics can be used to collect data (Bryman & Bell 2011). This study used an interview guide (Appendix 2) for the two respondent types, for which the same questions were asked. As explained by Kallio et al. (2016), the interview-guide enables researchers to follow somewhat the same structure and gather similar information. Accordingly, the guide used some main questions and sub-questions that were open-ended. Further, the questions were developed to enable flexibility and acquire in depth-answers.

The interview guide covered certain topics in relation to the study's aim. Questions were divided into themes based on the developed conceptual framework (figure 4). Thereby, the interview-guide's themes were useful to acquire a better understanding of SCC to reduce FLW in the supplier-retailer interface in bread supply chains. The interview guide had the following themes: The Bread Supply Chain, SCC Practices, SCC Motives and SCC Challenges. All questions in the interview guide were asked during the interviews. Further, some questions were asked that were not included in the guide. As explained by Bryman and Bell (2011),

this can be appropriate if it is of value for the study. It was also relevant to acquire general information about the respondents, such as name, professional role and experiences of FLW. This information is important to frame the respondents' answers in different contexts (ibid.). The guide also had some concluding questions.

During the interviews both of the researchers actively participated, to conduct flexible and interactive interviews. Before the interviews started, the study's aim and conditions were once again explained. For example, how the data were to be collected and transcribed. One of the researchers started asking questions and the other one took notes of the respondents' expressions, if needed. The one taking notes also jumped in and asked questions when appropriate. At the second half of the interviews, the researchers switched roles. This process was performed during all interviews.

3.5 Sampling Strategy

As investigating SCC in FSCs is a very broad scope, this study is delimited to bread supply chains in Sweden focusing on the supplier-retailer interface. The population under investigation is therefore Swedish bread suppliers and retailers. Choosing a specific food product´s supply chain and focusing on specific supply chain stages within the same geopolitical area, enables a better analysis because the economic, environmental and social factors would be disperse if investigating FSCs as a whole. The sample size was allowed to be rather small because of the study's time limitation and the desire to collect rich qualitative data. Thus, a few thoroughly conducted semi-structured interviews were more desirable than plenty of brief interviews.

The study used the purposive sampling technique, although the risk of bias and transferability issues sometimes associated with this technique (discussed in section 3.7). Due to the particular context of the study as well as difficulties of finding relevant actors agreeing to interviews, this sampling technique was most applicable. The purposive sampling technique disregards the probability-based sampling techniques (BRM n.d.). Instead, the samples are selected based on researchers´ judgment (ibid.). Bell et al. (2019) describe purposive sampling as a technique in which relevance to the study is considered when selecting the sample units. For example, if the selected sample units are believed to contribute to the fulfillment of the study's aim and answering the research questions (ibid.). Hence, the sample units were primarily selected based on their position in Swedish bread supply chains and on the researchers´ judgment.

3.5.1 Respondents

The interview respondents were contacted via email after their relevance to the study was identified online. Criteria for selecting which actors to contact included: being located and operating in Sweden, having operations involving bread and the positioning in the supply chain; restricted to solely suppliers and retailers. In the email, the study's aim was described and included a proposition to conduct interviews with the respondents. If the respondents were interested, a time and date for the interview as well as the form of the interview was decided on via email. All respondents who were interested in the study and agreed on the interview were selected. Table 6 provides a summary of the interviews and the respondents. Note that the respondents beforehand were viewed as independent of each other. Thus, they were not selected based on having connected supply chains or collaborations with each other.

Table 6. Interview Respondents.

Respondent	**Saltå Kvarn**	**Délifrance**	**Maxi ICA Supermarket Lindhagen**	**Maxi ICA Supermarket Värmdö**
Supply Chain Position	Supplier	Supplier	Retailer	Retailer
Company Representative	Slobodan Carapic	Hans Nilsson	Fredrik Rister	Jack Plüss
Company Representative´s Role in the Company	Flow of Goods and Production Manager	Country Manager	Deputy ICA-dealer (Vice Executive Director)	Store Manager
Interview Date	2022-03-24	2022-03-24	2022-04-05	2022-04-07
Interview Duration	45 min	40 min	35 min	30 min
Interview Form	Online meeting (including voice recording for transcription purposes)	Online meeting (including voice recording for transcription purposes)	Face-to-face meeting (including voice recording for transcription purposes)	Face-to-face meeting (including voice recording for transcription purposes)

Content Confirmed by Company Representative	Yes	Yes	Yes	Yes

3.6 Method for Analyzing Data

Bryman and Bell (2011) highlight the collection and analysis of qualitative data as an interactive process because researchers in qualitative studies often go back and forth between collecting and analyzing the data. The collection and analysis of data in this study could also be described as an interactive process, as the researchers collected and analyzed data simultaneously. As a result and in order to collect as useful data as possible, some interview-questions were adjusted or added according to what was discovered during the earlier interviews.

According to Polonsky and Waller (2019: 212) data analysis in qualitative research refers to "[...] the assembling, cleaning, and examining of the data […]." Coding is a useful technique when analyzing qualitative data (Bryman & Bell 2011; Polonsky & Waller 2019). Coding could be described as a way to structure data into broad themes, which are linked together (Polonsky & Waller 2019). This study used coding as a method for data analysis. This as coding enabled a structured way of dividing and interpreting the collected data. The researchers found that some data fit into several themes, and that some data did not fit into any of the developed themes. Thus, when dividing and interpreting the data, focus was on how it could contribute to the study's aim and answering the research questions. The data was also continuously reviewed during the analysis process.

Further, the interviews were recorded to facilitate transcription and to ensure that no important statements or quotations were lost. All interviews were conducted in Swedish as all respondents spoke Swedish. The researchers believed that having the interviews in Swedish was preferable, as it could improve the interactions during the interviews and possibly result in more detailed and rich answers. Therefore, the interviews were first transcribed in Swedish and then translated to English. This process enabled the researchers to become very familiar with the data. However, a critique is that some words or sayings could be difficult to properly translate (Bryman & Bell 2011). The researchers revised the English translations from the original versions in Swedish several times to minimize errors and mistranslations. Additionally, all recorded files and interviewing documents were backed up, to ensure that no data was lost.

The researchers started the coding process separately, by identifying key words and sentences. In the next step, the researchers discussed and systematically identified suitable themes together. The themes were based upon the interview guide (Appendix 2) and the conceptual framework (figure 4). The themes were identified as: SCC Practices, SCC Motives and SCC Challenges. Based on these themes, data was interpreted and analyzed.

3.7 Quality of the Research

A study´s quality must be considered, which is determined by its level of trustworthiness (Korstjens & Moser 2018; Bryman & Bell 2011). According to Korstjens and Moser (2018), the level of trustworthiness in qualitative research cannot be judged by the criteria used in quantitative research, such as internal validity, external validity, reliability and objectivity. The reason is because quantitative research leans on statistical methods, where tests and measures can be used to ensure quality. In contrast, there are no adopted standards of how qualitative research can be judged in terms of quality. Instead, researchers can use different criteria, that have several methodological strategies, to increase studies' trustworthiness (Noble & Smith 2015). Lincoln and Guba (1985) have developed such criteria, which have become common to use when assessing qualitative studies (Morse 2015). The criteria include: credibility, transferability, dependability and confirmability (Lincoln & Guba 1985), elaborated on below.

3.7.1 Credibility

Credibility refers to the truthfulness of a study's findings (Bryman & Bell 2011). This criterion is similar to internal validity within quantitative research (Shenton 2004). According to Thomas (2006) qualitative studies can improve credibility through participation checks of the collected data. This is further explained by Bryman and Bell (2011), who describe this as respondents validating the raw data from their interviews. In this study, the researchers sent the translated transcriptions of the interviews to the respondents. The respondents were able to make changes if they noticed any errors or identified answers needing further explanation. These participation checks were thus used to confirm the data and improve credibility.

The researchers have also separately, simultaneously and multiple times reread, analyzed and re-categorized the collected data. This process is referred to as persistent observation and is argued to improve a study´s credibility (Korstjens & Moser 2018). A well-conducted literature review can also strengthen credibility by affirming that the researchers are knowledgeable in the topic area as well as to position the knowledge gained from the research in regard to previous findings in

research (Bryman & Bell 2011). As explained in section 3.3, an extensive narrative review was conducted for this study, further strengthening the credibility. The researchers have also used peer reviews to improve the study´s credibility three times during the research process. Shenton (2004) highlights that researchers often have difficulties to distance themselves from the study. Peer reviews can therefore provide constructive criticism that challenges researchers' view on the study, which could enhance credibility (ibid.).

3.7.2 Transferability

Transferability is similar to external validity within quantitative research, used to evaluate if a study's findings can be applied in other situations (Shenton 2004). In qualitative research it is challenging, if not impossible, to generalize a study´s findings because the samples that the data is collected from are often too limited and small (ibid.). Instead, researchers should make it possible for the reader to decide if the findings can be transferred into another context (Korstjens & Moser 2018). Hence, it is the reader who decides the study's transferability. As such, researchers should provide a detailed and thick description of the respondents and how the study has been conducted. For example, by providing a description of the sampling strategy and data collection (ibid.). The researchers in this study have tried to provide a detailed description of the respondents and the interview process. For example, the respondents are described in table 6 and in chapter 4 and the interview guide is attached in Appendix 2. Further, Shenton (2004) highlights that the studied phenomena should be properly explained. The studied phenomena, SCC, has been thoroughly explained in chapter two as well as reflected on in section 3.1.

3.7.3 Dependability

Dependability is equal to reliability in quantitative research and refers to whether a study can be repeated (Shenton 2004). In qualitative research, dependability is obtained if a similar study can be conducted. In other words, sufficient information should be provided to make it possible for another researcher to follow a similar research process. However, it should not be confused with generalization of a study's findings (ibid.). To ensure dependability, researchers could provide an audit trail, which refers to having a complete description of the decisions made throughout the research process (Thomas 2006; Bryman & Bell 2011; Korstjens & Moser 2018). To improve dependability, the researchers have in this chapter provided a detailed description of all steps and choices taken. Further, Shenton (2004) states that an audit trail could be enhanced by providing documentation over the implementation process of the chosen methods. Therefore, a detailed description of the sample strategy is provided in section 3.5. Additionally, a

timetable of the study is included to visualize steps taken in the research process (Appendix 1).

Dependability is further enhanced through consistency in the research process (Korstjens & Moser 2018). For example, making sure that the chosen approach for analyzing data actually is followed in the analysis (ibid.). Coding was selected as a method to analyze the data in this study. Therefore, the data from the interviews has been categorized into different themes. Thus, the researchers argue that the chosen method for analyzing data; codning, as described in section 3.6, has been followed.

3.7.4 Confirmability

Confirmability could be compared to the objectivity criteria in quantitative research (Shenton 2004). Even though it is difficult to establish full confirmability in qualitative research, Bryman and Bell (2011) highlight that studies need to be conducted in good faith. Thus, try to attempt neutrality and not be influenced by personal values, which is especially critical when analyzing data (ibid.). As described by Morse (2015), some subjectivity is unavoidable, as researchers in qualitative studies pre-decide samples to acquire an understanding of the chosen studied phenomena. At the same time, it is preferable to have a rather small sample that is studied in detail in qualitative studies (ibid.). Shenton (2004: 10) also highlights that researchers should make sure that "[...] the work's findings are the result of the experiences and ideas of the informants, rather than the characteristics and preferences of the researcher." To this end, the researchers should openly reflect upon chosen approaches that were favored prior to others and their limitations (ibid.) Therefore, the researchers of this study have tried to critically reflect upon the chosen methods for the study in this chapter.

3.8 Ethical Considerations

Researchers should be aware of ethical issues throughout the whole research process (Bryman & Bell 2011; Barbour 2014). For example, Barbour (2014) mentions that attention must be given to the possible impacts of the chosen research methods and the way the study is presented to potential participants. Also, researchers must consider how the study may affect the individuals taking part in the study (ibid.). Further, Bryman and Bell (2011) highlight four key overlapping ethical considerations within business research: potential harm to participants, lack of informed consent, invasion of privacy and involvement of deception.

Potential harm to participants refers to whether the study could create personal and professional damage. To avoid this issue, participants should be asked if they want

to be anonymous (Bryman & Bell 2011). Therefore, the researchers provided a consent form to all participants, regarding how and if they wanted their personal information to be included in the study, which was sent prior to the interviews. The participants were informed that the researchers wanted to collect the following personal information: first- and last name, professional role, experience and company name. All participants gave consent to this. The participants were also notified that they could withdraw their consent at any time.

Prior to the interviews, the participants were also informed about the study's aim and were able to review the interview questions. This, to avoid any misunderstandings regarding the study's scope and boundaries. Moreover, the researchers informed the respondents that the thesis would be made public. The participants, located in the Stockholm region, were asked if they preferred meeting online or face-to-face. Due to the distance of the participating supplier respondents, they were asked beforehand if they were comfortable having the interviews online, which was accepted by both participants. The researchers also asked if they could record the interviews for transcribing purposes, which all participants approved of. During the interviews, the participants could decline answering questions that they were not comfortable with or which they did not want to answer. Further, the researchers asked if the study could include valuable quotations from the interviews. All participants were sent the transcripts after the interviews for approval. Lastly, the participants will receive the completed version of the thesis, where they will be able to see how their answers were analyzed and contributed to answering the study's aim and research questions.

4. Empirical Findings and Analysis

In this chapter, the interview respondents are further introduced and the findings from the data collection are presented and analyzed. The empirical findings resulted in several supply chain collaboration precondition themes in line with the study's conceptual framework (figure 4): supply chain collaboration practices, motives and challenges. These themes will be analyzed with the findings from each actor, starting with the suppliers, followed by the retailers.

4.1 Supplier: Saltå Kvarn

Saltå Kvarn is a Swedish food and bakery company, founded in 1964. The company has 52 employees and had an annual turnover of 200 million SEK in 2020 (Saltå Kvarn 2020). Saltå Kvarn is a non-profit company, owned by 15 foundations (ibid.). Their vision is to work for: "healthy people and a healthy planet, where man, animal and nature coexist for one meaningful life and a sustainable future" (Saltå Kvarn 2020: 10). The company produces various types of organic bread, with a high quality and a low environmental impact (Saltå Kvarn n.d.). The bread is produced in Saltå Kvarn´s own factory and is baked on flour from their own mill. They also have their own café and shop nearby. Saltå Kvarn produces other types of products as well, such as beans and lentils, with a total product range of approximately 150 products (Saltå Kvarn n.d.). Their products are sold in most grocery stores in Sweden, also to wholesalers, commercial kitchens and restaurants (ibid.).

4.1.1 Saltå Kvarn´s Perspective on Collaboration with Retailers

Forecasting is a *SCC practice* that Saltå Kvarn *actively* works with together with their customers, in order to make more accurate production volumes in relation to demand. They find this especially important since bread is a fresh product. However, Saltå Kvarn states that it is important to have a "plan b" for the bread not sold, so that less bread is wasted. For example, they provide recipes to their retailers on what to do with products not sold.

One *SCC motive* identified by Saltå Kvarn is that it is expensive with unsold products, both regarding warehouse costs and profits. There is also a consumer

demand for fresh bread, making accurate forecasts important. Another motive is that Saltå Kvarn wants their business operations to reflect their company vision:

> "[...] we want to contribute to a sustainable future in which humans, nature and animals can coexist, and so that you can use the resources for future generations as well. Thus, our decision-making process has to be aligned with our vision. [...]".

As a *SCC challenge*, Saltå Kvarn stated that: "It is almost impossible to achieve plus-minus zero on what a bakery delivers to a store or a customer." Further, they have a very limited knowledge of their customers´ ways of handling FLW. However, they also state that they have no official responsibility or possibility outside their own business to reduce FLW.

4.2 Supplier: Délifrance

Délifrance is a bakery company with origins from France (Délifrance Sverige, n.d.b). Délifrance´s mission follows: "Our roots are in the soil, the grain and our French baking know-how. Together everyday we grow and share this heritage and our love for baking. Responsibly, creatively, deliciously" (Délifrance UK n.d.). The company supplies retailers in 100 different countries, and has 14 production sites and 3100 employees (Délifrance Sverige n.d.b). The company specializes in viennoiserie, bread, savory and patisserie. The bread production assortment ranges from a variety of different bread rolls, bread loaves and baguettes. In Sweden, the company offers only frozen products and supplies bread to bakeries, cafés, hotels, restaurants, fast food restaurants, for catering, retail and wholesale (Délifrance Sverige n.d.a).

4.2.1 Délifrance´s Perspective on Collaboration with Retailers

One *SCC practice* Délifrance *actively* works with is trying to educate their customers in how to make use of products when they are not day-fresh anymore. For example, they inspire their customers with "day-two" recipes and encourage them to pass these on to the end-customers. This is also done via dialogue with customers at fairs or directly in the shops or cafés. For example, at one particular fair Délifrance shows their "day-two" products to illustrate that these products are still good and do not have to be thrown away. They state that this could get their customers more open-minded to reduce food waste. Another important SCC practice emphasized by Délifrance is that they *actively* work with their customers in product development in the already baked products assortment. These products are delivered frozen to Délifrance´s customers, which enables the bread to be fresh when needed; the customer simply thaws the products and they return to their fresh state. This enables less effort and easier handling of the products, which in turn

reduces FLW. Lastly, Délifrance forecasts together with their customers to make orders more accurate. They also use what they call "made-to-order." This means that they produce the products when they receive an order from a customer.

As a *SCC motive*, Délifrance explained that reducing FLW in the supply chain also means economic savings for all parties. For example, they mentioned: "If we throw away 10 % of all the food we sell, we could theoretically cut 10 % of our production, and in that way save a lot of money." Reducing FLW also correlates to saving other resources, which impacts global sustainability, identified as another SCC motive. This is also a demand from and need in society. Further, Délifrance explained that, theoretically, they could benefit from not collaborating to reduce FLW and increase their sales. However, they state that this would be "[...] very short-term thinking." Instead, they highlight the value and need to:

> "[...] think about the foundation and get involved, with all those who sow, harvest, manufacture and transport, and so on. There is so much food that we just throw away that maybe could have been provided to other people in need of food."

Délifrance also strives to initiate SCCs with large sized partners, as it provides better opportunities to impact and influence to reduce FLW. Thus, identified as another SCC motive.

Délifrance has also noticed a tendency that actors solely focus on their own operations, rather than thinking of the supply chain as a whole. This is identified as a *SCC challenge*. Délifrance means that actors need to shift focus:

> "We must move away from the price discussion [...] and realize the needs of the consumers. Together. And solve it. Then, later, you can discuss the price. Today, it is instead price first, because that is most important, instead of looking at what the consumers want. And there I think we need to get better; at realizing consumer needs, and develop those, instead of sitting and discussing price."

Another identified SCC challenge, particularly when working with larger sized retailers, is that the supplier becomes easily replaceable. Thus, resulting in difficulties to initiate or impact the terms of a collaboration.

4.3 Retailers: ICA Sverige (Sweden)

ICA Gruppen is a company consisting of several segments: ICA Sverige (Swedish grocery stores), Rimi Baltic (Baltic grocery stores), Apotek Hjärtat (pharmacy), ICA Fastigheter (real estate) and ICA Banken (banking) (ICA Gruppen n.d.c). All segments have a core focus on groceries (ibid.) and operate according to the vision: we will make every day a little simpler (ICA Gruppen n.d.b). ICA Sweden consists

of almost 1300 grocery stores located in Sweden, with a total of around 8500 employees (ICA Gruppen n.d.c). In 2021, the company had a revenue of about 92 000 million SEK. ICA Sweden is the leading food retailer in Sweden with a market share of approximately 36 % (ibid.).

ICA stores are independently owned and operated, which makes them adapted to the local market (ICA Gruppen n.d.a). However, there are also extensive collaborations in store establishments, supply, logistics, IT and market communication; enabling economies of scale. The ICA stores are divided into four different store formats varying from prioritizing wide product ranges, prices, fresh products, organic products, service and convenience. Both ICA representatives in this study are "Maxi ICA Stormarknad" stores. These stores provide a wide product range and value low prices. They also offer various non-food products (ibid.). On their website, they promote a guarantee for the freshness of all bread products, meaning if a product does not fulfill certain freshness criteria the customer can return it and receive twice the money back (Maxi ICA Stormarknad Lindhagen n.d.b; Maxi ICA Stormarknad Värmdö n.d.b).

4.3.1 ICA Lindhagen

ICA Lindhagen is the largest supermarket located in the centre of Stockholm (Maxi ICA Stormarknad Lindhagen n.d.a). The store bakes fresh bread in their own bakery but are also buying bread from various suppliers (Maxi ICA Stormarknad Lindhagen n.d.b).

ICA Lindhagen´s Perspective on Collaboration with Suppliers

In regard to *SCC practices*, ICA Lindhagen states that they presently *do not actively* collaborate with their bread suppliers. However, ICA Lindhagen highlights that they *would like to* share information with their bread suppliers for forecasting purposes. Especially since they have a very well-functioning ordering system being used on other products in their store. For example, they explained that Arla Foods, a company providing dairy products (Arla Foods n.d.) is quite similar to their bread suppliers, as Arla Foods also delivers their products to the store themselves. However, one important difference is that Arla Foods is integrated in the store's ordering system, which facilitates the ordering volumes. ICA Lindhagen suggests that the same would be preferable to do with their bread suppliers. Further, they state that the most desirable would be to prevent FLW from occurring in the first place: "[...] prevention is where we can save almost 80- 90 % of the waste [...]." Thus, a solution could be to forecast the demand together with their suppliers.

One *SCC motive* for ICA Lindhagen is from a profitability perspective, because, in general, it is costly to overproduce and order more products than are sold. They also

value contributing to a sustainable society, by minimizing FLW within their business. Therefore, it is important to find a balance between supply and demand. They note that: "[...] it feels unnecessary to throw away things that can be eaten […]." Also, ICA Lindhagen means that collaborating to reduce FLW, for example through information sharing and forecasting, would be beneficial in terms of better meeting customer demands and possibly resulting in economic gains.

A major *SCC challenge* inhibiting ICA Lindhagen from collaborating with their bread suppliers is the bread model exception in the Unfair Trading Practices (UTP) legislation. ICA Lindhagen explains that the UTP was implemented in Sweden at the end of 2021 and it was meant to protect smaller sized suppliers in Southern Europe from being exploited by larger sized retailers. However, ICA Lindhagen expressed a concern of it (the UTP) being misinterpreted. They have previously and are still operating according to the bread model, meaning that the suppliers are responsible for the handling and cost of bread not sold in their store. Previously, ICA Lindhagen had dialogues with their bread suppliers regarding ordering volumes. For example, regarding seasonal fluctuations, holidays or events. However, now, an exception in the UTP affects the bread model in a way that the retailers are not able to interfere, in any way, with the suppliers' ordering processes. If they do, the retailers become responsible for any possible products not sold. ICA Lindhagen explains that this makes them as retailers "tied up," resulting in no incentives or creativity for them to develop collaborations with their bread suppliers to reduce FLW. They also describe this having caused the bread suppliers to "[...] live within their own little bubble [...]," as the interaction between the suppliers and retailers are restricted. While ICA Lindhagen mentions that it would be beneficial to skip the bread model and order bread in the same way as all other products (meaning the retailers order the products and are responsible for the waste), they also state that: "[...] it has always been like this, so it is like an old thing that lives on."

Another *SCC challenge* brought up by ICA Lindhagen, is that customers expect the store to offer as fresh bread as possible, because bread tends to degrade rapidly after being baked. Due to difficulties in filling the shelves with products that fulfill the customer expectations, there will always be bread left over. They also mention their lack of knowledge about how their suppliers handle bread waste and waste volumes as a challenge, as well as that collaborating would require effort, resources and possibly an integration of systems, which could be challenging.

4.3.2 ICA Värmdö

ICA Värmdö is located in Stockholm County in central east Stockholm County (Maxi ICA Stormarknad Värmdö n.d.a). The store includes a bakery from which

fresh bread is offered in the store every day (Maxi ICA Stormarknad Värmdö n.d.b). They also offer bread from other suppliers (ibid.).

ICA Värmdö´s Perspective on Collaboration with Suppliers

As a *SCC practice*, ICA Värmdö *actively* engages with sharing sales data with their bread suppliers to enable them to make orders more accurately according to the demand. However, the suppliers decide the order volumes themselves. For example, the store shares sales data from previous holidays. Usually, this data is requested by the suppliers via email. They also try to have a continuous and open dialogue with their suppliers when they deliver the bread to their store. ICA Värmdö finds this practice useful to ensure that the bread shelves are continuously restocked throughout the day.

One *SCC motive* as to why ICA Värmdö is keen to support their suppliers with sales data is because: "We don't want a lot of bread to be thrown away either. We are sitting in the same boat." Thus, when their customers purchase bread there is no competition between them and their suppliers: "[…] we are a team, so of course we want to provide our suppliers with the right conditions to do a good job." They explain that if a supplier's bread has high sales volumes, it benefits both the supplier and the store, and vice versa. ICA Värmdö also highlights the importance of sharing statistics with their bread suppliers to provide the right amount of products to meet their customers' needs.

Contrastingly, one *SCC challenge* is the desire to reduce FLW while not losing sales. ICA Värmdö says that: "[...] we want extremely well-filled shelves, but at the same time bread has a very short shelf life and the customer wants to buy bread as fresh as possible. So that equation is quite problematic and causes food waste." For example, consumers look at the baked-date rather than the expiration-date when it comes to bread products. ICA Värmdö further expresses that they lack economic incentives to prevent FLW from occurring: "We only get money for what we sell, not for what is removed; that is no cost for us." Therefore, they can provide day-fresh products at all times during the day, without taking responsibility for the waste and costs that occur. Additionally, ICA Värmdö notes that there is no consensus in expectations of how the bread shelves should look in the store between them and their suppliers:

> "[...] it might be that we have slightly different expectations of what a shelf should look like. Us in the store think that no goods should ever be sold out, while as a bread supplier, working actively towards reducing food waste, may think that it is okay that a product is out for a few days."

Another *SCC challenge* is that they work according to the bread model, which they note is a well-established working routine in the bread industry. ICA Värmdö thinks

that the bread model has become more clear by the UTP-legislation. They explain that they are the ones setting the price on the bread in store, whereas the rest is managed by the suppliers; ordering, re-stocking, removing and returning unsold products on the shelves. However, the UTP has also made them become more passive in their dialogue with their bread suppliers. ICA Värmdö also mentions a *SCC challenge* to be limited insights in the suppliers´ operations: "[...] we do not know how much food waste our bread suppliers have." While the store registers returns, they have no incentive to not follow-up on it.

5. Discussion

In this chapter, the research questions are answered and the aim of the study is fulfilled by discussing and contrasting the empirical findings and previous research. The chapter is structured according to the conceptual framework. The first three sections will focus on identifying supply chain collaboration practices, motives and challenges. These will thereafter be addressed as supply chain collaboration preconditions in the supplier-retailer interface in a critical reflection to end the chapter.

5.1 Supply Chain Collaboration Practices

In this section, the first research question will be addressed. Research question one follows: *What types of collaboration practices do bread suppliers and retailers engage with to reduce food loss and waste?* Based on both previous research and the empirical findings, the identified SCC practices include *information sharing, forecasting, communication* and *education* (see table 7 below).

Table 7. Summary of Supply Chain Collaboration Practices identified in the Supplier-Retailer Interface. Own Explanation.

Supply Chain Collaboration Practices found in the Supplier-Retailer Interface	**Explanation**
Information Sharing	Sharing information, such as sales data, with collaborative partners to operate more efficiently. Mainly to produce forecasts.
Forecasting	Projections of supply and demand with the aim to better meet customers' needs and reduce operational costs.
Communication	Interactions between collaborative partners with the aim to influence and reduce FLW. For example, through face-to-face dialogue or emails.

Education	Refers to enlightening or instructing collaborative partners about how to make use of products that are not day-fresh anymore. For example, through recipes.

Many of the identified SCC practices are supported by previous research. For example, Wee et al. (2016) categorizes forecasting as an information sharing practice in SCC. Also, Dania et al. (2018) stresses information sharing as a key SCC practice. Further, Chan and Prakash (2012) argue that communication is necessary for other SCC practices to take place. However, the SCC practices identified in previous research are not all in consensus. For example, education as a SCC practice has not specifically been identified in previous research, although previous research, such as Cao and Zhang (2011), has highlighted joint knowledge creation as a SCC practice. Perhaps knowledge exploitation in joint knowledge creation (ibid.), could be somewhat compared to an education practice. Other SCC practices identified from previous research, for example, joint decision making and incentive sharing (Wee et al. 2016), did not exist. This was due to the retailers working according to the bread model and complying with the UTP legislation (discussed in section 5.3 as a SCC challenge).

The empirical findings found that the suppliers and retailers engaged in different SCC practices. However, they expressed similar ideas regarding promising practices for successful SCCs to reduce FLW. One major difference was that the suppliers acknowledged engaging in information sharing, forecasting, communication and education, whereas the SCC practices the retailers engaged with were scarce. One of the retailers stated that they had no collaborations with their bread suppliers due to the bread model and UTP legislation (discussed in section 5.3 as a SCC challenge). The other retailer supported their suppliers by sharing sales data, although the suppliers placed the orders and managed the shelves in the store themselves. Their way of communicating was via email and dialogues face-to-face, thus, using informal and uninfluenced communication (Cao et al. 2010). Communication was also identified as a needed SCC practice by the suppliers, seeing it as an opportunity to influence their retailers to reduce FLW. This could be viewed as direct and informal communication (ibid.).

Both suppliers emphasized that they, together with their retailers, use forecasts to reduce FLW. This enables more accurate production volumes in relation to the demand. Forecasting was identified as a prioritized practice by the suppliers since it prevents FLW from occurring in the first place. Secondly, spreading knowledge and sharing recipes with their retailers, to make use of unsold bread, contributed to less bread being wasted. Thereby, education as a SCC practice was identified. Although actual SCC practices were lacking from the retailers, they did speculate

on practices that potentially could be beneficial if they would collaborate with their suppliers to reduce FLW. These practices included information sharing and ordering system integration, which in previous research could be compared to resource sharing (Zacharia 2009) and joint decision making (Wee et al. 2016). Considering the empirical findings and previous research, it seems like in the Swedish context, particularly because of the bread model and the UTP legislation, some of the SCC practices found in previous research are inhibited.

5.2 Supply Chain Collaboration Motives

In this section, the second research question will be addressed. Research question two follows: *What are the collaboration motives for bread suppliers and retailers to reduce food loss and waste?* Based on both the empirical findings and previous research, the identified SCC motives include *improving business performance*, *focusing on economic incentives and aligning operations with company values* and *solving supply chain problems* (see table 8 below).

Table 8. Summary of Supply Chain Collaboration Motives identified in the Supplier-Retailer Interface. Own Explanation.

Supply Chain Collaboration Motives found in the Supplier-Retailer Interface	**Explanation**
Economic Incentives	Referring to monetary savings as a result of reducing FLW in operations through SCC. It also includes increased profits by better meeting customer's demand.
Aligning Operations with Values	Ensuring that a business operates according to its stated values, focusing on the sustainability perspective.
Solving Problems in Supply Chains	Better being able to solve problems by more knowledge, capabilities and perspectives being available in a SCC.

The empirical findings and previous research emphasize that there are economic incentives to collaborate to reduce FLW (Kumar et al. 2017). For example, the suppliers highlighted that unsold products are costly and affect profitability. Similarly, the retailers noted that SCC can be important, especially from a profitability perspective, as it could enable better meeting customer demand by using information sharing to produce more accurate forecasts. This would produce a more attractive supply to the consumers, and thus reduce leftover products. Improving business performance was in previous research identified as a SCC motive (Matopoulos et al. 2007; Ramanathan 2014; Aggarwal & Srivastava 2016).

However, the respondents very explicitly expressed the economic incentive as a SCC motive to reduce FLW. It will therefore be identified as a separate motive in this study.

The respondents expressed their desire to align their operations with their company's values (including a sustainability focus) and having a positive and sustainable impact on society and the future. It was also noted that this was expected from them by society. Previous research did not identify this as a SCC motive. However, it did bring up that SCC could improve sustainability performance, as part of improving business performance, which could be beneficial for both retailers and suppliers, for example through waste reduction (Matopoulos et al. 2007; Cao & Zhang 2011; Ramanathan 2014; Aggarwal & Srivastava 2016; Wee et al. 2016; León-Bravo et al. 2018b). Due to the respondents' emphasis on values, it is identified as a separate SCC motive to reduce FLW in this study.

Another motive identified in both the empirical findings and in previous research is that SCC can enable better problem-solving in the supply chain. Previous research argues that problem solving could be improved by SCC, because actors often face similar problems and could contribute with different knowledge and perspectives on problems (Im et al. 2019). Two major problems shared in bread supply chains, as highlighted by the respondents, are to align supply and demand, and reduce surplus bread. Thus, making information sharing, for example sales data, a very important SCC practice to enable more accurate forecasts. This could also be connected to the SCC motive of increased supply chain knowledge (Simtupang & Sridharan 2008; Ma et al. 2019; Mofokeng & Chinomona 2019), although not specifically stated by the respondents.

5.3 Supply Chain Collaboration Challenges

In this section, the third research question will be addressed. Research question three follows: *What challenges do bread suppliers and retailers associate with collaboration to reduce food loss and waste?* Based on the empirical findings and previous research, the identified SCC challenges include *power asymmetries in the supply chain, the bread model, the UTP legislation, viewing supply chain stages as separate* and *"the full-shelf logic"* (see table 9 below).

Table 9. Summary of Supply Chain Collaboration Challenges identified in the Supplier-Retailer Interface. Own Explanation.

Supply Chain Collaboration Challenges found in the Supplier-Retailer Interface	**Explanation**

Power Asymmetries in the Supply Chain	Retailers usually have more bargaining power than suppliers in the supply chain, enabling them to behave in ways that cause bread to be wasted.
The Bread Model	A well-established business routine between bread suppliers and retailers. It refers to suppliers taking responsibility for the handling and costs of surplus bread.
The UTP Legislation	Restricts retailers from interacting with their suppliers, as this could risk them becoming responsible for bread surplus which they do not want.
Viewing Supply Chain Stages as Separate	The perception of only being responsible for FLW that occurs within one's own business. Thus, not taking any action to collaborate with other actors in the supply chain to reduce FLW.
"The Full-shelf Logic"	Difficulties in balancing the reduction of FLW, while at the same time always having full shelves to meet customers' demand of having fresh bread in store.

One major SCC challenge found in both the empirical findings and previous research was power asymmetries in the supply chain, restricting SCC to take place. However, the suppliers and retailers explained this from different points of views. The suppliers mentioned that it is difficult to initiate SCCs with large sized actors. Similarly, previous research stated that retailers, due to their size and direct contact with the consumers, in general have more bargaining power than suppliers (Matopoulos et al. 2007; Devin & Richards 2018). The retailers, on the other hand, highlighted the bread model as a SCC challenge, also referred to as take-back agreements in previous research (Brancoli et al. 2019; Ghosh & Eriksson 2019). According to the bread model, the suppliers are responsible for handling and covering the costs of bread not sold (Svensk Handel 2021). The empirical findings illustrated the bread model as a well-established practice in bread supply chains. Thus, there is no pressure and economic incentives for the retailers to change this way of operating. This results in a status quo of how FLW is managed between the suppliers and retailers.

The empirical findings also revealed that this power asymmetry has become further problematized by the UTP legislation. The UTP was implemented in Sweden in November 2021 (Regeringskansliet 2019), hence, it has not yet been addressed in previous research. The UTP was developed to inhibit retailers from conducting unfair trading practices that create risks or costs for the supplier. As such, it was

meant to stabilize power asymmetries in supply chains (ibid.). However, the empirical findings indicated that the UTP instead has restricted retailers from collaborating with suppliers to reduce FLW. This is because of an exception in the UTP, making it possible for the bread model to still be used. This exception is only valid if it is the suppliers causing the waste (Svensk Handel 2021). From the empirical findings it was noted that the difference the UTP and the bread model exception has made for the actors, was that previously the retailers could support the suppliers with setting the ordering volumes. If they do that today, the retailers are viewed as partly responsible for any possible waste, which they do not want because of economic reasons. The SCC practice of joint decision making is therefore inhibited. Accordingly, the retailer respondents expressed that they have limited the interactions with their bread suppliers, making the UTP a SCC challenge, because the retailers do not want to become responsible for any possible waste. For example, one of the retailers expressed that the suppliers live in "their own bubble," leading to viewing the suppliers as separate units. Hence, FLW is viewed as connected to the suppliers´ operations, creating no incentives for the retailers to collaborate to reduce FLW. Similarly, the suppliers suggested that it would be beneficial to consider the supply chain more holistically, rather than viewing the stages as separate. More specifically, one of the suppliers argued that there is a need to move away from price discussions and instead work together to improve how customers´ needs are fulfilled, which in turn could reduce FLW. Hence, viewing the supply chain stages as separate is identified as a SCC challenge to reduce FLW.

Lastly, the empirical findings identified "the full-shelf logic" as a SCC challenge. This means that it is difficult to balance working to reduce FLW, while at the same time having full-shelves in the store to not lose sales; illustrating contradictory objectives for the retailer. "The full-shelf logic" is also caused by retailers wanting to meet customer expectations of having fresh bread available in the store. This is supported in previous research, for example, both Mena et al. (2011) and Iakovlieva (2021) found in their studies that trying to meet customers' demand contributes to over-ordering and bread being wasted. Also, the demand fluctuates on a daily basis, making it extremely difficult to accurately estimate the right bread volumes. This results in consciously having more bread than needed on the shelf at the end of the day to ensure meeting customers' demand. In line with "the full shelf logic," the economic incentive to sell as much bread as possible, was also expressed by the retailers.

5.4 Critical Reflection of this Study

The aim of the study is *to increase to the understanding of how SCC can be used in between suppliers and retailers to reduce FLW*. To address the aim, a multi-case study of Swedish bread suppliers and retailers has been conducted. A compilation of the answers to the study's research questions shows that the suppliers and retailers associate both different and similar SCC practices, motives and challenges, and that they are all influenced and connected to each other. Together, the SCC practices, motives and challenges are viewed to create SCC preconditions in the supplier-retailer interface. This is illustrated in the conceptual framework of this study (figure 4). Hence, the SCC preconditions could both enable and strain SCCs in the supplier-retailer interface.

When critically reflecting on the empirical findings in relation to the study's aim and research questions, the researchers could identify important points for discussion. First, the SCC preconditions found in this study provides an overly simplified image of reality. In practice, SCC is far more complex. One factor contributing to this complexity is that a supply chain's main purpose is to distribute products to end-customers, rather than reducing FLW from occurring. Therefore, it could be argued that actors collaborate to fulfill this purpose, with reducing FLW becoming a side-effect of these collaborations. As found in this study, different SCC practices, for example forecasting, can aid both in product distribution as well as to reduce FLW.

Another critical reflection is that SCC academically has different interpretations and definitions. This study is therefore framed by the chosen conceptualization of it, consisting of SCC practices, motives and challenges (see figure 4). Accordingly, this conceptualization of SCC has shaped the type of data collected, how it was analyzed and the study's findings. Therefore, it could be argued that the study has been framed by subjectivity (see section 3.6.). Further, as this study has placed SCC in a market and business context, one could argue that supply chains would not exist if there was not for collaborations. SCCs are also codified in contracts and arrangements between suppliers and retailers, which support or reproduce various outcomes. This must be considered when interpreting this study.

According to the study´s research philosophy, social phenomenon are difficult to separate from their social context. Thus, when the supply chain is changing, so must the conceptualization of SCC. This also means that the identified SCC preconditions are not static, instead they are constantly changing and evolving. Further, the empirical findings and the knowledge gained of SCC in the supplier-retailer interface has been based upon the interview respondents' own perceptions of collaboration. It could therefore be argued that the empirical findings and the

study's findings would differ if data had been collected from other organizations and/ or individuals; possibly having different perspectives on SCC. This could especially be the case in this study, as none of the respondents had formal SCC arrangements in place to reduce FLW. Further, the respondents were few and selected based upon different traits (see section 3.5). This means that the empirical findings have provided a quite limited view on SCC preconditions. Although this has been taken into consideration, it means that the study's results could be difficult to generalize. Thus, SCC is empirically context dependent. In turn, this means that SCC preconditions could differ depending on the social context.

6. Conclusion

This last chapter reconnects to the aim and research questions of the study. It also presents the major findings and contributions of the study. The chapter ends with suggestions for future research.

This study has conducted a multi-case study with the following aim*: to increase the understanding of preconditions for SCC between suppliers and retailers to reduce FLW*. To conclude, the study found that suppliers and retailers associated both similar but also different views on preconditions for collaboration; SCC practices, motives and challenges. Further, these similarities and differences of how collaboration is viewed have consequences on the development of collaboration to reduce FLW.

Previous research, such as Kaipia et al. (2013) and Annosi et al. (2021), suggest collaboration as a solution to reduce FLW. This study found different SCC practices that bread suppliers and retailers engage with to reduce FLW, motives for why they engage with these practices, and challenges that strain or inhibit collaborations. The most promising SCC practice was identified to be information sharing to produce forecasts. Communication was also identified as an important SCC practice, in line with previous research (Fynes et al. 2005; Chan & Prakash 2012). The most important SCC motives to reduce FLW were identified as economic incentives and aligning business operations with company values. This is similar to previous research highlighting improving business performance as a SCC motive (Matopoulos et al. 2007; Ramanathan 2014; Aggarwal & Srivastava 2016). This study also identified solving supply chain problems as a SCC motive, supported by Im et al. (2019). Moreover, the study identified SCC challenges to include "the full-shelf-logic," actors viewing supply chain stages as separate, power asymmetries in the supply chain, the bread model and the UTP-legislation. As illustrated in this study, SCC practices, motives and challenges are influenced and connected to each other. This study also stresses the identified SCC preconditions to be context dependent. Therefore, SCC preconditions to reduce FLW in the supplier-retailer interface may differ depending on its social context.

6.1 Contributions

This study suggests that suppliers and retailers need to understand the preconditions for SCC in order to be able to develop well-functioning collaborations. The study identified that collaborations to reduce FLW between bread suppliers and retailers are inhibited by the purpose of the supply chain; distributing products to end-customers. Additionally, the established business routine; the bread model, as well as legislations; the UTP, constrain collaborations. Therefore, this study contributes empirically, in a broad scope, by highlighting SCC to prevent rather than reduce FLW from occurring in FSCs due to the social contexts of FSCs. This suggests that suppliers and retailers at present need to seek collaborations outside the supplier-retailer interface in bread supply chains to reduce FLW. Alternatively, there is a need to reform existing business routines within bread supply chains and legislations affecting bread supply chains, to enable collaborations between suppliers and retailers. Thereby, this study also contributes empirically to the understanding of the preconditions for SCC in the supplier-retailer interface. This is emphasized in the developed conceptual framework of this study (see figure 4). Additionally, the study has addressed the research gap identified in section 1.3; how collaboration in practice is conducted and perceived by suppliers and retailers as separate units in Swedish bread supply chains. This, through the identified the preconditions for SCC in this study.

Even though the identified SCC preconditions in this study are dependent on the study´s particular context, the conceptual framework developed in this study (see figure 4) can be applied by other actors than supplier and retailers, and in different supply chains. Thus, this study has contributed to the business administration field by increasing the understanding of the preconditions for SCC between supply chain actors. Academically, the study contributes to a conceptual understanding of the preconditions for SCC to reduce FLW in FSCs. This contributes to filling another identified research gap, also discussed in section 1.3; the need to better understand the motives and challenges for collaboration and how collaborative relationships are developed in supply chains. Due to limited previous research having this particular study focus, this study could become a building block that other studies can be based on.

6.2 Future Research

Suggestions for future research include investigating SCC in the supplier-retailer interface in other supply chains and between a plurality of actors, not only suppliers and retailers. More research is also needed in other FSCs with particular focus on how such collaborations are functioning in practice. This would contribute to an

increased academic and empirical understanding of SCC to reduce FLW in FSCs, which remains a critical issue. Another future research suggestion is that the conceptual framework of this study (see figure 4) could be used as a tool when analyzing a specific SCC in practice or how suppliers and retailers could develop new collaborations. The framework enables an understanding of preconditions for SCC from both the supplier and retailer perspective, which is useful to be aware of when developing or maintaining collaborations.

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Uppsala, May 2022

Linn Bergman & Jessica Holmqvist

Appendix 1: Timetable of the Study

Month	**Tasks**
January:	- Start of project (17/1-22) - Work plan submitted (28/1-22)
February:	- Chapter 1: Introduction, Background, Problem Formulation, Aim and Research Questions - Chapter 2: Literature Review and Conceptual Framework - Chapter 3: Method
March:	- Develop questions for interviews - Chapter 4: Empirical background - Data collection: 2 interviews (24/3-22) - Transcription and translation of interviews
April:	- Data collection: 2 interviews (5 and 7/4-22) - Transcription and translation of interviews - Half time seminar (6/4-22) - Chapter 4: Empirical findings - Chapter 5: Analysis and Discussion
May:	- Chapter 7: Conclusion and Future Research - First draft ready (16/5-22) - Thesis day including the preparation of a scientific poster (25/5-22) - Final seminar including presentation and opposition
June:	- Final Submission

Appendix 2: Interview Guide

The interviews present themselves, the purpose of the study, the conditions for the interview and an inquiry about the respondent's participation in the study.

A Personal Information

1. Give a short presentation of yourself. What is your role within the company; what tasks and responsibilities do you have?
2. Do you have direct contact with your company's suppliers/ retailers?
3. Do you work with issues related to food loss or waste within your supply chain?

B. The Bread Supply Chain

4. Which bread suppliers/ retailers in Sweden do you work with and how would you describe them?
5. How does food waste and food waste arise between you and your suppliers?
6. How do you handle and work to reduce food loss and waste?
7. What is your view on ordering bread to ensure that you can always meet your customers' needs and fill shelves in the store, as opposed to specifying your orders to minimize the risk of food loss and waste?

C. Supply Chain Collaboration Practices

8. Do you collaborate with your suppliers/ retailers to reduce food loss and waste?
9. If yes, which collaboration practices do you use to reduce food loss and waste? How do you consider these collaborative practices to contribute to reducing food loss and waste?
10. If not, what collaboration practices do you think would contribute to reducing food loss and waste? How would you contribute to such collaborations?

D. Supply Chain Collaboration Motives

11. If yes, what were the reasons why you started to collaborate to reduce food loss and waste? Why did you choose to collaborate with the suppliers/ retailers you collaborate with?
12. If not, why do you not collaborate to reduce food loss and waste?

E. Supply Chain Collaboration Challenges

13. If yes, what has enabled these collaborations?
14. If not, what do you think could have enabled having such collaborations?
15. If yes, have you experienced any challenges in these collaborations?

F. Ending Questions

16. If yes, have you noticed in any practical evidence that food loss and waste have been reduced due to our collaborations?
17. If not, do you think that collaborations could lead to reduced food loss and waste, and in what way?
18. What aspects do your company consider important for a successful collaboration between you and your suppliers/ retailers?

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